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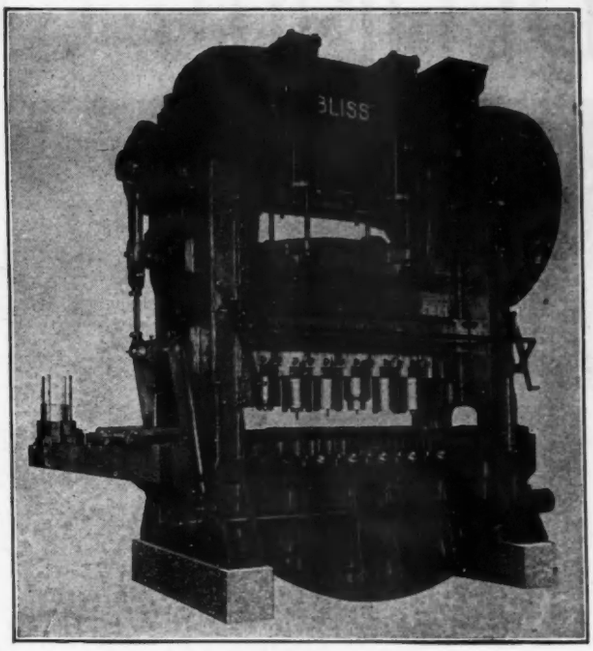

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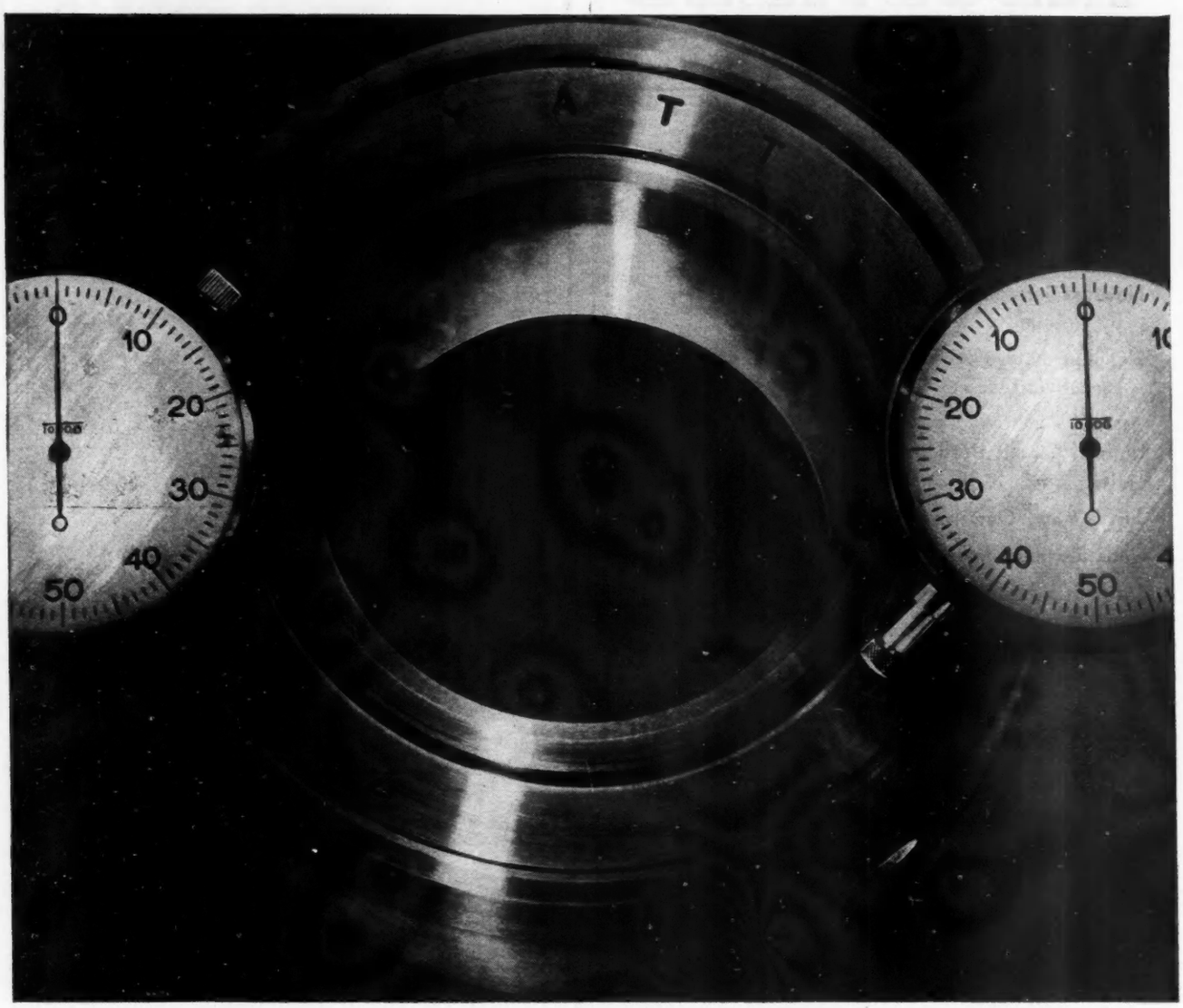

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QUIET ROLLER BEARINGS

AUTOMOTIVE INDUSTRIES

Vol. 67, No. 3 • THIRTY-FOURTH YEAR • July 16, 1932

by Norman G. Shidle

New Tax Barrage Looms When 1933 Solons Meet

Highway Users are Awakening to Dangers of Continued Bombardment from State Bodies

Forty-four Legislatures Will Try to Balance State Budgets at Expense of Vehicle Owners

THIRTY-FIVE governors will be inaugurated next January. Forty-four state legislatures will meet next year. A lame-duck Congress will convene in Washington next March.

In ordinary times this cacophony would bode a fine crop of new taxes, and increased restrictions on design and operation for the entire automotive industry.

But these are extraordinary times.

When the governor-inaugurating and legislature-meeting season rolls around the people of the states and the Nation may find their governments faced with budgets even more unbalanced than they now are; with strenuous demands for unemployment and other types of emergency relief funds; and with a set of existing tax laws which will have failed by wide margins to produce the revenues previously expected of them.

All of which will simply act to increase the pressure for easy-to-collect taxes on the vehicle owning portion of the populace and to intensify the demand for further restriction of size, weight and load specifications of commercial units. Under the burning sun of new revenue needs, the crop of proposed legislation inimical to automotive interests may be expected to fructify more luxuriantly than ever before.

Fortunately, the users of the highways as well as the manufacturers and sellers of motor vehicles have been aroused to the coming dangers more quickly and more actively than in former pre-legislative years. This depression-bred awakening is evidencing itself

"..... a halt must be called ..."

"Taxes threaten the whole structure of our highway transportation system. The individual who uses the roads will find himself saddled with mounting costs in movement of goods ..."
Alfred P. Sloan, Jr.

through widespread comments by individuals within the industry and by final organization of powerful groups of highway users into the Highway Users Conference.

It has been evident for several years that some coordinated means was needed to help promote the best interests of highway users, particularly because of the very highly concentrated and coordinated character of the groups engaged in the promotion of legislation and taxation tending toward hindrance of full economic use of the roads. The limited amount of detailed information immediately available concerning the newly organized Highway Users Conference makes difficult any full estimate of its potentialities and possibilities at the moment. The mere completion of its organization, however, is indicative of a finally aroused consciousness of unity among all highway users and thus furnishes the most important single sign of pro-highway awareness of the legislative shoals which lie in the 1933 channel.

Tax Unrest Is Universal

While based on gradual realization of a need which has grown greater every year for some time back, the final organization of an informal Highway Users Conference in Washington on June 28 probably came about because agricultural, industrial and private highway-using groups have lately become very seriously disturbed by the recent sharp increases in taxes on automotive units and on products entering into the use of motor vehicles.

The articles of organization of the new conference indicate its purpose to be that of encouraging the development of equitable bases of taxation for the use of the public highways and the prevention of the imposition of undue burdens on highway traffic. The conference is composed of representatives of some 40 or 50 national groups or associations whose members use the highways commercially in one way or another. In addition to the automotive and allied groups such as the National Automobile Chamber of Commerce, American Automobile Association, Rubber Association, American Petroleum Institute, etc., the conference includes agricultural, industrial and vocational groups of various kinds.

The meeting which resulted in actual organization of the conference was called by Alfred P. Sloan, Jr., president, General Motors Corp., who has been elected chairman, and C. F. Whiting, president, International Milk Dealers' Association, Boston, who functioned as chairman of the committee on procedure.

Vice-chairmen elected were Ernest R. Smith, executive vice-president, American Automobile Association, and Chester H. Gray, Washington representative of the American Farm Bureau Federation. L. J. Taber, Master of the National Grange, Columbus, Ohio, was elected secretary-treasurer.

A manager of chief of staff will be selected by a committee composed of the chairman, vice-chairmen and the finance committee.

The general purposes of the conference can probably be defined best by reading of the statement made by Mr. Sloan following the organization meeting:

"To the extent that there is economic justification for taxes upon users in return for highway development," Mr. Sloan said, "no one can find much fault with them. But when we see the vehicle becoming an instrument for general taxes of all sorts far beyond those which the user should pay, then a halt must be called. Otherwise, the whole structure of our highway transportation will be menaced and the individual who uses the road will find himself saddled with operating costs which will add materially to the cost and movement of goods."

There will be no dues or assessments on members of this informal Highway Users Conference, which will meet only once or twice a year and which will be supported, it is understood, by voluntary contributions. It would appear that the main function of the conference will be to collect and disseminate to its members information concerning proposed and current legislative matters, both state and national, which may affect the regulation or taxation of motor vehicle units, parts or operations.

Special Work Is Undertaken

Further evidence of industry's realization of the need for action in advance of 1933 appears in the special efforts being made to stimulate and amplify the work of various state truck owners' associations, as outlined on page 929 of *Automotive Industries*, June 25, 1932. The activities related there take on new significance in the light of the final formation of the Highway Users Conference. At that time, it will be recalled, *Automotive Industries* stated:

"The new program involves support of state truck association activities by truck manufacturers, automotive parts companies, large truck operators and others. Individual truck manufacturers in many cases have already expressed a willingness to foster and aid actively the state truck owner association development in their own states and definite means of taking action along these lines is now being discussed.

"Indications are that this development may proceed along the line of the 'Ohio Plan,' so called because it is a program which has been worked out for possible coordination of truck associations in that state. The plan is designed to bring the existing associations in Ohio into a single strong state association.

"Financial support having been assured by the means indicated in the preceding paragraph, the staff of the new organization will be free to devote its time to the work of promoting truck owners' interests, providing legislators with facts desired about the truck

situation and rendering full and continuous service to the entire membership.

"District offices are contemplated, where necessary, thus insuring prompt service to all members. The board of directors of the state association will probably consist of two representatives of each of the local chapters which will be established throughout the state and of such others as may be needed to include the best interests of the industry. Association officers will be elected by the board of directors."

Even the engineers of the motor vehicle industry have awakened very fully to the importance of the legislative struggles which lie ahead. They see their design activities being circumscribed by inflexible regulations, their production economies endangered by a multiplicity of conflicting laws and their economic future limited as well. Clear evidence of this appeared at the recent summer meeting of the Society of Automotive Engineers held at White Sulphur Springs last month. It was down at White Sulphur, one historically minded engineer learned this year, that the Governor of North Carolina made his now famous observation to the Governor of South Carolina that: "It's a long while between drinks."

Engineers Alarmed at Taxes

So, a few weeks ago automotive engineers made other important observations on that historic spot. F. C. Horner, General Motors Corp., gave warning of many perils in sight. "The time was never so opportune," he said, "for railroads to force through legislation against motor transportation. Forty-two legislatures meet next year. And the railroads have the automobiling public with them. We are headed for a lot of trouble."

He with several others, pointed out that the recent decision of the U. S. Supreme Court in the Texas case upholding the right of a state to legislate against motor transportation for the benefit of the railroads opened up the way for similar action by other states.

"Expansion of use of heavy-duty, high-speed units is ended," he predicted, commenting on a statement that trailer operating speeds had reached a figure which was bringing about the use of streamlined bodies. Part of the blame for adverse legislation belongs to truck operators, in Mr. Horner's opinion, because of abuse in truck and trailer use.

Two representatives of large fleet organizations, J. F. Winchester, Standard Oil Co. of N. J., and Leo Huff of Pure Oil Co., observed that snaking of trailers, making it almost impossible for passenger cars to pass, aroused resentment in the minds of the driving public resulting in unfavorable opinion in legislative halls. Two other fleet men, A. F. Coleman, Standard Oil Co. of N. Y., and F. K. Glynn, American Telephone & Telegraph Co., also discussed legislation, Mr. Coleman urging procurement of legislation to permit operation of tractor and trailer trains up to 65 ft. overall length, and Mr. Glynn telling of the work of the S.A.E. code committee, in compiling information on which a code could be based.

Martin L. Pulcher, president of Federal Motor Truck Co., denounced the railroad legislative program against truck and bus operators.

"Now, with 25 per cent of the new Federal revenue bill charged directly against users of cars and trucks," he said, "and in the face of excessive levies against motor vehicles by every state in the Union, the railroads are pressing their restrictive legislative measures in almost every state.

"Everyone interested in the industry will do well to interest themselves in this serious matter, and stand ready to aid the National Automobile Chamber of Commerce in every possible way.

"It is true that the railroad business is poor—but all business is poor these days. The motor vehicle industry gives the railroads annually far more freight than is being taken from them by our industry.

"Now, to carry on this fight, the industry is underwriting a nation-wide campaign to bring into the fight against higher taxes and more restrictions operators and users of motor vehicles."

Bearing definitely on the promotion of constructive legislation was the agreement by members of the S.A.E. Motor Vehicle Code Committee on what constitutes proper length, height, and weight restrictions. To insure complete agreement, the conclusions reached by the committee meeting at White Sulphur have been sent to the entire membership of the committee for a mail ballot. If approved, the S.A.E. recommendations will be submitted to the Motor Vehicle Conference Committee of which the S.A.E. has become a member.

Another aspect of the indirect relation between the society and possible legislative activity has been through the road impact tests.

And so throughout the country and throughout the industry those interested in the sound economic development of motor vehicle design and motor vehicle operation have become aroused to spread correct and accurate information about highway usage problems and, where necessary, to fight effectively for their rights.

"..... to collect, disseminate tax data ....."

Advisory Committee Highway Users' Conference:

Three Years: Chester H. Gray, American Farm Bureau Federation, Munsey Bldg., Washington, D. C.

A. C. Pearson, President, National Publishers Assn., 239 West 39th St., New York City.

Ernest Smith, Executive Vice-President, American Automobile Assn., Mills Bldg., Washington, D. C.

Alfred P. Sloan, Jr., President, General Motors Corp., 1775 Broadway, New York City.

Amos L. Beaty, President, American Petroleum Institute, 250 Park Ave., New York City.

Two Years: George E. Clinton, Int'l Association of Milk Dealers, c/o Sheffield Farms Co., 524 W. 57th St., New York City.

C. E. Childe, Chairman, Highway Transport Committee, National Industrial Traffic League, Omaha, Neb.

L. J. Taber, Master National Grange, 970 College Ave., Columbus, Ohio.

J. D. Tew, Rubber Manufacturers Association, 250 West 57th St., New York City.

Willard Chevalier, Vice-President, American Road Builders Assn. and McGraw-Hill Co., New York City.

One Year: Herbert P. Sheets, President, Retailers' National Council, Meyer-Kiser Bldg., Indianapolis, Ind.

John Simpson, President, Farmers' Union, 630 Indiana Ave., Washington, D. C.

C. O. Sherrill, National Chain Stores Association; Vice-President, Kroger Company, 35 East Seventh St., Cincinnati, Ohio.

Emory Rice, City Baking Co. Baltimore, Md.

Sleepless Nights Ahead for Engineers as Sales Executives Demand "Doughnuts"

UNHAPPY is the lot of engineers who oppose general adoption of "doughnut" tires for 1933 automobiles. Sales departments seeking any and all means of increasing business volume favor the new tires. Anyone who says anything against a project with sales possibilities these days is likely to find himself no better off than the peacemaker in a street brawl—and he may be looking for another job!

Furthermore, engineers, car and tire, are forced to argue not the broad question of reducing tire pressure, but that of the degree of such reduction. "Was the change from high pressure to balloons an improvement?" the engineer is asked.

"It was," is the answer.

"If low pressure is good, lower pressure is better, is it not? Why not take the next step and go to super-balloons? Why not a bigger and better super-balloon?"

How shall engineers answer this one? They have no strong objections to taking one step—or two steps. But they *do* object to being compelled to make running broad jumps.

They know that car owners can, and do, buy one oversize to secure greater mileage under severe conditions.

They know, too, that the Tire & Rim Association table of sizes, loads and inflations for "experimental practice low pressure balloon tires for passenger cars" embodies tires which are triple oversizes for standard balloons. (See page 82).

But to exaggerated oversizes they will not agree.

Their opposition is strong, active, determined and desperate. Even for the double and triple oversizes they ask a breathing space during which they may make necessary changes in car design. Against a wild scramble to see who can go farthest and fastest in ballooning they will battle to the last man.

Recall 1923-24

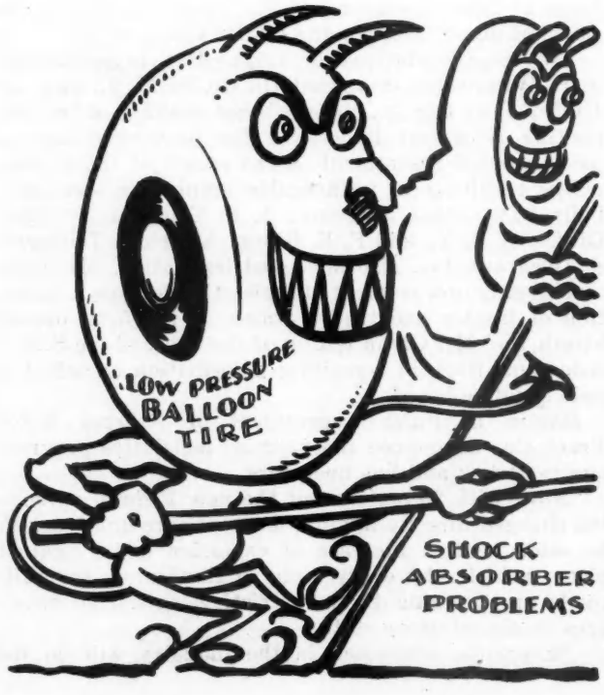
Many engineers liken the present situation to that in 1923 and 1924 when balloons were very much in the minds of engineers and the public. Arguments in favor of balloons then are the same as those advanced on behalf of "doughnuts" now. At that time reduction in tire pressure was carried too far and there was a retreat. Dr. B. J. Lemon in his S.A.E. paper* showed that average tire pressures in 1923 were 58.5 lb., but in 1924 they dropped to 28 lb., and were then stabilized at about 36 lb. in 1928 and continued at approximately the latter figure until 1932. Triple oversize sections on much smaller diameter wheels are proposed for original or optional equipment, but present field replacement practice is not confined to triple oversizes.

Tire makers supplied a 9.00 in. super-balloon for Chevrolets, Fords and Plymouths, which is seven sizes larger than the 5.25 standard balloon. More conservative application were the 7.50 in., a quintuple oversize, and a further drop to 6.50, a triple oversize.

Much good will come from the present "doughnut" tire agitation, just as good resulted from the 1923 experiment, in the opinion of many engineers. As a result of stirring up of the whole question, better riding qualities will be developed. Engineers are not at the end of their resources in improving balance, weight distribution, springing, shock absorbers, seats and other parts contributing to comfort.

If a stampede takes place and there is a rush to put on overgrown balloons despite and notwithstanding all engineering arguments to the contrary, then engineers are certain trouble will arise. Of the objections to "doughnut" tires, three are basic in nature, and, therefore, in the opinion of many engineers, entitled to special consideration. They are:

1. There is a definite lag in steering.
2. Cars so equipped are unstable at both front and rear because hubs may move an inch or so in three dimensions without appreciably displacing circumferences of the tires or causing them to deviate from their course.
3. Features of greater useful value to car owners than the "doughnut" tires can be supplied for the



*"'Doughnut' Nightmares Haunt Engineers at S.A.E. Summer Session," page 903, June 25, 1932, *Automotive Industries*, and "Engineers Eschew Overtures of New 'Doughnut' Tires," page 33, July 9, 1932, *Automotive Industries*.

by

James W. Cottrell

extra cost of new style tires plus the cost of changes in cars necessarily accompanying their adoption.

Lag in steering and a peculiar form of instability which results in a "jiggling" ride for rear-seat passengers are worrying a large percentage of the engineers interviewed on the subject. They recognize the action as symptoms of a cause which they are powerless to remove.

The lag in steering, they point out, exists because the "doughnut" tire possesses a relatively larger road contact area than does an ordinary balloon tire, and therefore, tends to maintain a straight course. When a driver, wishing to turn to right or left, pulls on the steering wheel the steering knuckles and hubs begin to swing around while the tire tread still continues in a straight line.

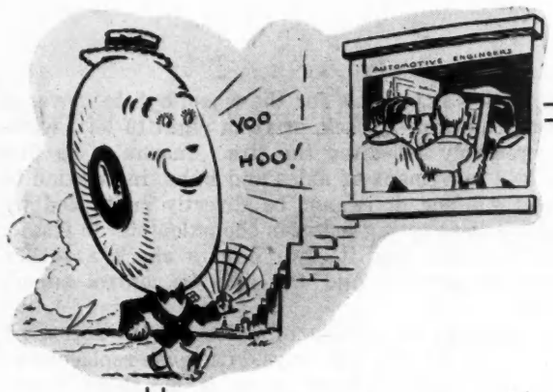
A driver accustomed to ordinary tires may give the steering wheel a yank and, as a result, he oversteers. A little experience in driving will overcome the tendency to oversteer, but the steering lag remains. The larger the tire and the lower the pressure of a tire, for a given load, the greater is this steering lag. In sudden turns to avert collisions, this lag is a serious disadvantage in the opinion of several engineers.

Allied in cause with steering lag is instability of both front and rear axles. The same softness which makes it possible for "doughnut" tires to swallow bumps, makes it possible for the wheel hub to move up or down, forward or back, or from right to left, without appreciably deflecting the tire. Inasmuch as this action is a movement of axles and hubs, in relation to the road surface, it cannot be directly controlled by shock absorbers acting between the axle and car frame. As one engineer put it, "we need a shock absorber between the ground and the axle to control superballoons."

This freedom of motion of axles affects action of the car in several different ways. On some replacement installations of "doughnut" tires it has been found necessary to block valves on front shock absorbers or to greatly restrict shock absorber action for small spring deflections. W. S. James, Studebaker Corp., commenting on this phase of the problem, said: "We have tried to make springs work by lubricating them and fitting covers. Now to install these new tires we cut the springs out by blocking the shocks."

Another effect of axle movement within the circumference of tires is experienced, according to several engineers, when driving on a crowned road. When driving on the right side of a crowned road, axles on a car equipped with "doughnuts" are displaced sidewise and the driver must use "left-rudder" all the time to keep the car on a straight course. When the car crosses the crest of the road, as when passing another

Multitude of Design Problems Force Themselves Upon Tire, Chassis and Body Engineers as Vogue for Exaggerated Oversizes Opens a New Stimulus to New Car Sales

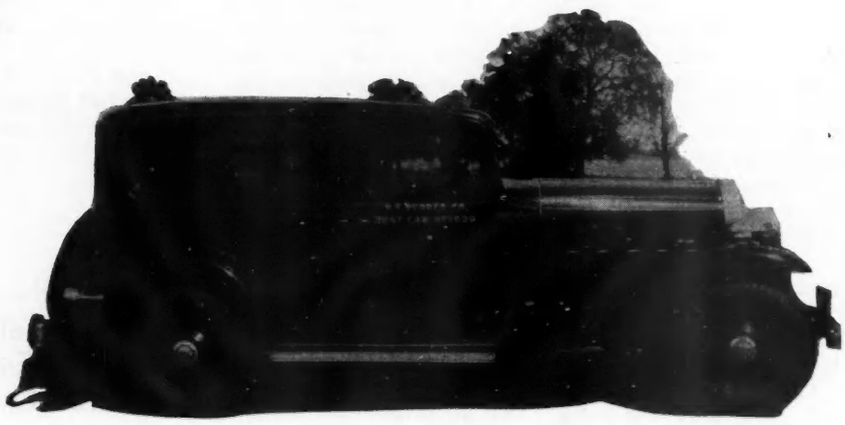


Next Week P. M. Heldt

will discuss some of the fundamental problems of

Low-Pressure Tires

Not for years has anything so disturbed the engineering thinking of the industry as has this subject, brought to the fore by B. J. Lemon's paper at the recent Summer Meeting of the Society of Automotive Engineers



Buick 60, 1932, 8.25—16 Supers on 6.00" rim width. (Standard tire is 6.00—18) 8.25 is quadruple oversize (6.00, 6.50, 7.00, 7.50, 8.25). It is an expensive step-up, and many believe it is too large a tire from appearance standpoint, steering, etc.

vehicle, the sidewise displacement changes to the left and the car swings too far because of steering lag and displacement of the longitudinal axis of the car in relation to the axis of the tire contact surfaces. This requires a new driving technique, and several observers claim that driving down the center of a highly crowned road with large-sized "doughnuts" is difficult.

J. C. Tuttle, Goodyear Tire & Rubber Co., commenting upon stability of tires themselves, as distinguished from car stability, said: "The 9.00 tire must have about 18 lb. air pressure for stability. And if 18 lb. pressure is used we do not need a 9.00 tire for a light car; it is better to use a smaller amount of rubber, say a 7.50 tire."

More than one engineer is amazed that any considerable number of people can be found willing to pay the extra cost of installing "doughnut" tires and new wheels on cars now in use or the extra cost of optional "doughnut" equipment on new cars. In some cases this charge is approximately equal to the spread between price ranges. There is some evidence that the buying public is cylinder-conscious to a marked degree, but it now appears that some buyers are willing to pay more than extra cost of two, or even four, extra cylinders for the sake of a difference in tires. As Dr. Lemon expressed in his paper, "Even in present hard times the perhaps unsuspecting public appears willing to part with from $50 to $100 to have something different in tire equipment, without adequate assurance by the vehicle maker or the tire maker that the car as a whole will perform better or even as well as before."

"Doughnuts" furnished as standard equipment on a large scale on 1933 cars will, of course, involve very much less extra cost than for replacement or optional equipment at present. Nevertheless there seems general agreement that there will be an extra cost, even though the tires themselves cost no more, due to changes which will be made in passenger cars to accommodate the new style tires.

Asking engineers what they could offer sales departments, and the car-buying public, in place of the prospective extra cost of "doughnut" tires is like taking a boy to a toy shop and asking him to choose his Christmas present. Restricted, as they have been, by the uncompromising boundaries of price classes, they were almost overcome by the thought of being free to spend a considerable sum of money—as car costs are figured—for other things. One engineer saw in prospect his pet idea of power steering, which he believes cannot be much longer postponed. Real honest-to-goodness ventilation appeals to another engineer.

A third, keeping his speculation within the bounds of riding qualities, toyed with the idea of independent wheel-springing. More than one engineer forgot his worries about "doughnut" tires for the moment, while enjoying the unusual privilege of thinking about spending more money on a passenger car model.

Interest in the safety of "doughnut" tires in the hands of the automobiling public is not confined to tire and car engineers. Highway engineers are said

to be excited over the dangers of super-balloons. They fear harder steering, roll off of tires on turns, and sudden blow-outs, according to Dr. Lemon. At least one engineer secretly expressed the hope that motor vehicle administrators would provide the necessary restraint upon too sudden application of too large "doughnuts."

Front-end troubles may be merely an annoyance or they may be a positive menace according to degree. Dr. Lemon, in his S.A.E. paper, reported that quite a lot of front-end trouble developed on some cars and very little on others. Corrective measures produced a reasonably acceptable ride at rather low-air pressures. Mr. Tuttle's experience with change-overs was not so satisfactory. He said that some of them "give front-end trouble that we have not been able to overcome."

Tests have been made of artificial blow-outs of "doughnut" tires at 65 to 70 m.p.h. on 7.50/15 four-ply tires. Drivers, however, were warned by operation of the blow-out mechanism that a blow-out was coming. So far, no blow-out tests have been conducted, as far as is known, on 8.25 or 9.00 tires. The overshadowing question is what will happen when "doughnut" tires blow at high speeds in the hands of ordinary drivers. Some engineers are concerned about the consequences, others believe that average drivers will be able to handle the situation, just as they learned how to handle cars with ordinary balloon tires. Almost all of the engineers are reserving judgment on this point until there is more field experience.

Here's What Happens—

In addition to the basic objections to general adoption of large "doughnuts" tire and passenger car engineers condemn the newcomers on many other charges, to wit:

They throw passenger car design out of balance by emphasizing tires to the exclusion of other features. Present-day design must be changed in many important particulars if "doughnut" tires are to be used to advantage, or at all.

New steering systems required must possess the directly opposing qualities of high efficiency and great dampening ability.

Space available for brakes is further reduced.

Better traction will impose greater braking stresses.

Fenders must be redesigned.

Shock absorbers of different characteristics must be employed.

Unless tread is widened there will be less room in rear seats.

Wheels will be about 30 per cent heavier.

Cost per mile is greater, at least at present.

Nearly every car on which "doughnuts" have been tried has developed front-end "nervousness."

Cars which ride well with balloons are not improved by "doughnuts."

Top speed and acceleration are reduced.

Gasoline consumption is increased.

The car is retarded when traversing rough spots.

Air pressures must be maintained within 1 lb. of specified amount which is much less than the change in pressure taking place because of heating of the tire at high speed.

A large majority of all of the engineers who expressed their opinions about "doughnuts" either publicly or privately mentioned the fact that the new tires throw car design entirely out of balance. Many of them made it plain that their objection was not to the work involved in balancing the design but against deciding to improve one feature without giving much thought to its effect upon other parts. They see that emergency changes must be made for the immediate future and they predict a complete car redesigned in a not very distant future, if "doughnuts" are generally accepted.

Why Redesigning is Necessary

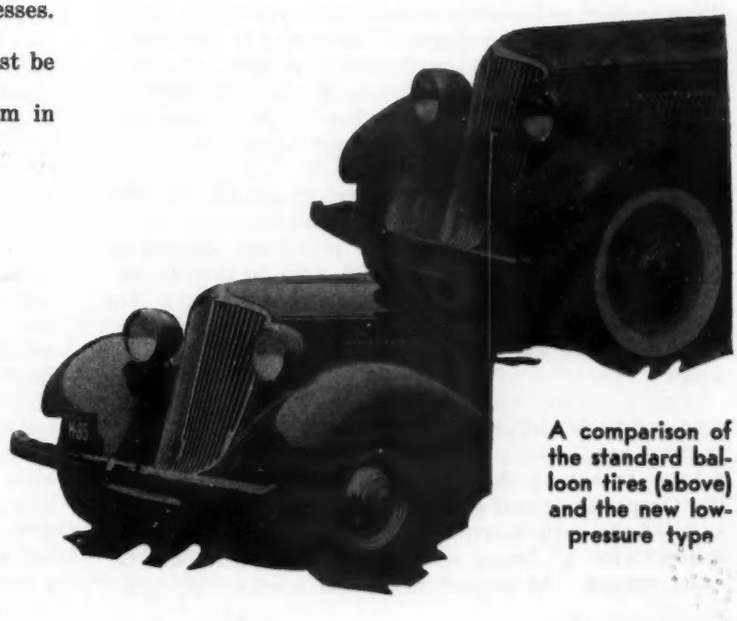
These engineers see a lot of complex problems in the making of either the emergency changes or the complete car redesigned. Discussion of problems of steering gear design were not confined to engineers specializing on this unit. In fact, an interesting feature of interviews with engineers was the agreement between opinions expressed by engineers concerned with one problem and those working on general designs.

There was general agreement that "doughnut" tires are harder to turn when the car is stationary, as in parking. In itself, this is a small matter. Steering gears are available, or can readily be designed which can turn any "doughnut" tire. And, according to a prominent engineer, increase in cost for the steering gear necessary for the job would not be very large. But this is not all of the problem.

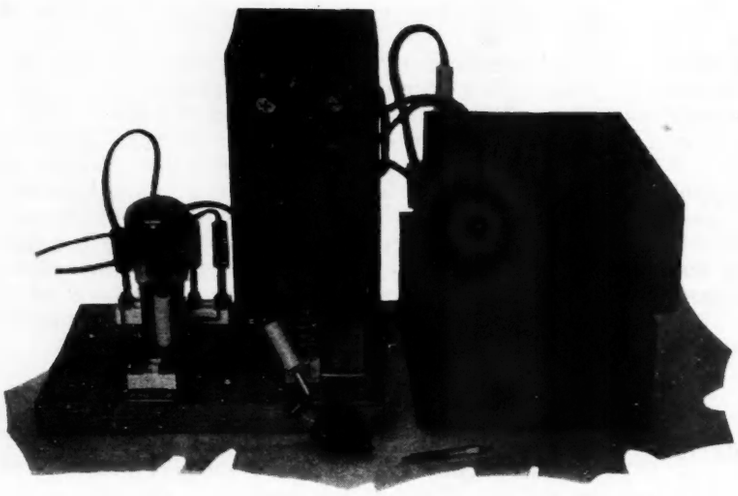
The steering gear needed to handle a car on "doughnuts" probably will be stronger and have a higher numerical ratio and higher general efficiency than gears of standard design in order to reduce the pull required on the rim of the steering wheel. So far, so good. Front-end difficulties call for a steering system with a relatively high dampening effect which requires friction rather than high efficiency. Ability to turn quickly favors low ratio. An engineer asks how it is possible to make a steering gear which is both very efficient and full of friction.

Two series of tests, one conducted by a steering gear

(Turn to page 82, please)



A comparison of the standard balloon tires (above) and the new low-pressure type



Unusual Circuit

by

P. M. Heldt

Fig. 1—Experimental equipment with the exception of the oscillograph

Schnauffer Employs Miniature Spark Plugs, Screwed Into Cylinder Head, for Observing Phenomenon of Detonation in Internal Combustion Engines

SOME months ago we printed in these columns a review of a paper by Dr.-Ing. Kurt Schnauffer on the phenomenon of detonation in internal combustion engines.

In the experimental work covered by Dr. Schnauffer's paper, use was made of an apparatus for measuring flame velocities in combustion chambers by ionizing gaps between pairs of electrodes located at different distances from the ignition plug. While this general method had been used previously by other investigators, the particular arrangement of circuits used by Dr. Schnauffer is original with him and should be of interest to other workers in this field.

This same experimental method has been used also in other investigations by the same author and is described in detail in a thesis on Velocities on Flame Propagation in Gasoline-Benzol-Air Mixtures in High-Speed Spark-Ignition Engines, submitted to the Berlin Technical College for the degree of Doctor of Engineering, which was later printed in pamphlet form by VDI Verlag, Berlin NW7. The thesis also is incorporated in the Yearbook of the German Aeronautical Experimental Institute for 1932.

That flame conducts electric currents has been known for a long time. When a source of electromotive force is connected to electrodes whose points are separated by a gas-filled gap, a current will start to flow across the gap as soon as the flame reaches the latter. In the experiments on velocity of flame propagation, this current is utilized to energize the coil of an oscillograph.

Experiments on the conductivity of flames were carried out by W. Hankel as far back as 1859. He found that the conductivity of an ionized gap is dependent to a large extent on the temperature of the gas and on the temperature and surface area of the cathode. In spite of the early discovery of the phenomenon of the conductivity of flame, very little is known about its exact nature. At present the belief is generally held that it is due to ions, but whether ionization is the result of the chemical reaction or is dependent directly upon the thermal effects is not known.

As was explained in the previous article in these columns, a single cylinder engine was used in the experiments, the cylinder being one unit of a Siemens & Halske radial air-cooled aircraft engine. Four spark plugs were screwed into the cylinder head, two from the top and two at an angle from opposite sides. The plug at one side was used for ignition, while the remaining three plugs served to indicate the moment of arrival of flame at their respective gaps.

Arrival of the flame at the gaps is indicated by the deflection of an oscillograph coil. Measurements were made by means of a six-coil oscillograph, but Dr. Schnauffer points out that a recording galvanometer, a Braun tube or a high-speed recorder would have served the same purpose.

Uses Three Set-Ups

Three experimental set-ups were developed for the investigation. Fig. 1 illustrates the equipment (with the exception of the oscillograph) used for the final one, which is the simplest of the three and proved completely satisfactory not only in connection with this particular project but also in the research on detonation and in an investigation on flame temperatures in spark-ignition engines in operation.

In addition to the oscillograph there are needed for each measuring point, one radio tube (shown at the left in Fig. 1), an A battery of 4 volts, an anode battery of 200 volts (divided into a 180-volt B and a 20-volt C battery), a resistance of about 40,000 ohms, and a measuring electrode (spark plug). Since this type of

t Used to Measure Flame Velocities

measuring electrode can be easily inserted in the cylinder wall, measurements can be made on any engine.

The Siemens & Halske oscillograph has six coils. One of these records the ignition current, while three others serve to record the ionization currents at the three measuring points. Vibrations of a tuning fork are recorded on the same film as the various currents, to give a time record.

It is not intended to describe here the different circuit arrangements used successively. Suffice it to say that the first proved somewhat defective in that it furnished a current record in which an alternating current was superimposed upon the ionization current, so that the point at which the latter began to flow could not be determined with any high degree of accuracy. This objectionable feature was overcome in the second arrangement, from which latter the third and final arrangement was developed by omitting a number of pieces of apparatus found unnecessary. One of the items eliminated in passing from the second to the final arrangement was a milli-ammeter in the B-battery circuit. Dr. Schnauffer states that while this instrument may well be dispensed with in the principal tests, it is advisable to use it when first making adjustments. Inertia lag is said to be practically absent in the curves obtained with this method.

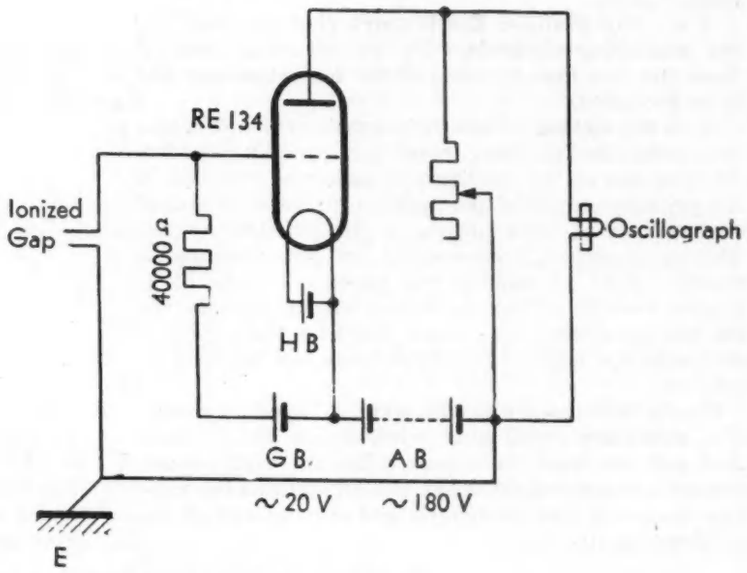


Fig. 2—Diagram of circuits for one measuring point. (RE 134) amplifying radio tube; (HB) A battery; (AB) B battery; (GB) grid battery; (E) ground

The values of the ionization currents and their dependence on the flame temperatures may be determined from the results obtained by Lusby. As shown in Fig. 4, at a flame temperature of about 2200 deg. F. a current of 50 x 10^{-9} amp. is obtained, while at a flame temperature of 3600 deg. F. the current is 1900 x 10^{-9} amp. These currents are said to be sufficient to operate oscillographs, provided suitable connections are used.

In view of the dependence of the ionization current on the gas temperature it would seem to be possible to draw conclusions regarding the flame temperature in the cylinder during the expansion and exhaust strokes. For instance, in Fig. 3 one may recognize the quick change in the flame temperature (sudden rise

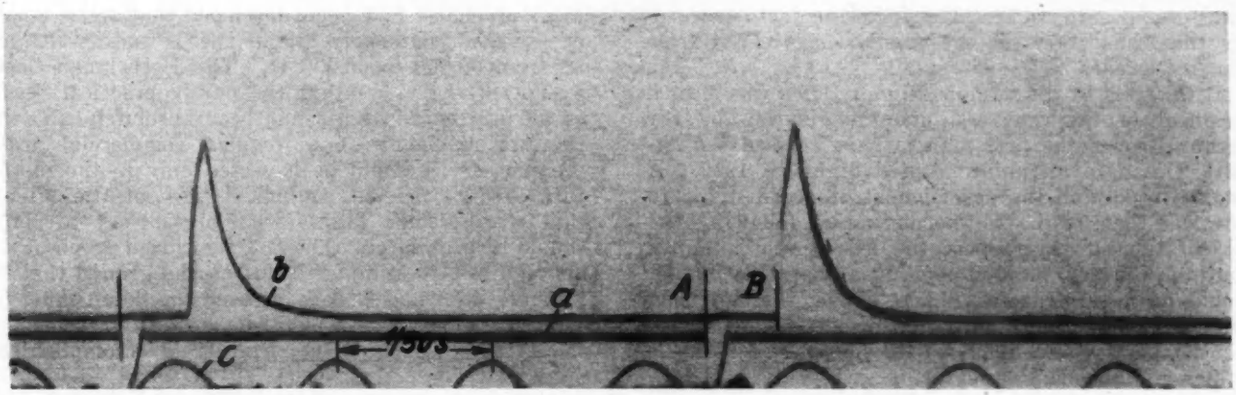


Fig. 3—Oscillogram for the measurement of velocity of flame propogation (continuous current methods). Upper curves 1600 r.p.m.; lower curves, 930 r.p.m. (a) ignition currents; (b) ionization currents; (c) time record; (A) ignition point; (B) points of arrival of flame

of the ionization current at the measuring electrode d) which results from turbulence in the combustion chamber.

Although so far it has not been possible to make definite temperature measurements by this method, because of the many disturbing factors, there are many cases in which it is sufficient to know the relative temperatures.

A slightly modified Bosch spark plug was used for the measuring electrode. No inconvenience resulted from the fact that one side of the ionization gap had to be grounded.

With the method of measurement described it is necessary that the ignition current be accurately recorded. At first one of the oscillograph coils was included in the primary circuit of the ignition magneto, to record the moment of interruption of the primary circuit. This arrangement, however, did not give unequivocal results. Next an attempt was made to use the high-tension current of the spark-plug circuit directly for the measurements, but a spark plug with two insulated electrodes special built for the purpose soon caused preignition.

Finally satisfactory results were obtained by means of a miniature spark plug screwed into the cylinder head and insulated therefrom. After the high-tension current has jumped the spark gap and ignited the mixture, part of it returns directly and part by way of the oscillograph circuit.

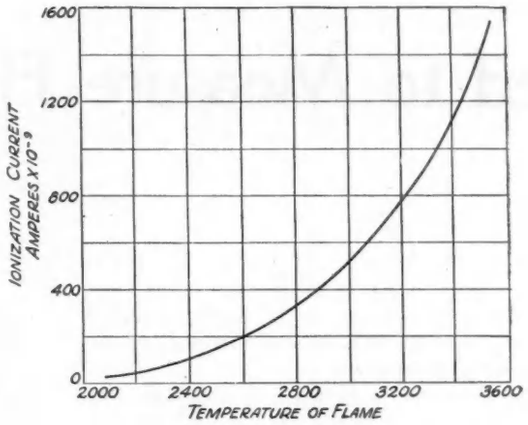


Fig. 4—Dependence of the ionization current on the temperature of the flame, according to Lusby

This results in the ignition current being recorded on the film as a sharp deviation of a luminous line. A KLG mica-insulated miniature spark plug with slate insulating ring worked without causing preignition under any conditions, although the cooling facilities were poor.

Ocean Fliers Hold International Congress to Exchange Experience

A FIRST international congress of ocean fliers was held recently in Rome, Italy, under the auspices of the Italian Royal Aero Club, its organization having been proposed by the Italian Secretary for Air, Signor Balbo. No less than 50 delegates from 10 different countries attended, all of whom had successfully crossed the ocean by air. The object of the congress was announced to be an interchange of experiences by practical men in the interest of future trans-oceanic air traffic. The following facts concerning the transactions of the congress are taken from *Die Luftwacht:*

At the start of the sessions Signor Balbo was elected president of the congress, upon nomination by Sir Arthur Brown, the first man to have crossed the Atlantic Ocean in an uninterrupted flight, in 1919. A detailed report on the development of ocean flying to date was then read. In the discussion following the presentation of this report the Portuguese admiral, Coutinho Gerster, pointed out that a sharp distinction should be made between flights across the northern Atlantic and southern Atlantic respectively, because the northern route required thorough and difficult studies and scientific observations, while the southern route, because of its more nearly uniform weather conditions, could be conquered much more easily.

Upon his motion a North Atlantic Commission and a South Atlantic Commission were appointed for deliberations during the remainder of the congress. The Spaniard Iglesias proposed that the congress should work out a number of trans-oceanic routes, so it would be in position to present concrete plans to any interested government. He suggested that the governments establish a central office for the collection of meteorological information to aid in this work. This proposal was unanimously adopted.

As regards the feasibility of a regular transatlantic service by airplanes, it was remarked by the Frenchman Assolant that this problem could be solved only after airplanes had been developed that were capable of flying at materially higher speeds and at altitudes of from 30,000 to 60,000 ft. The Frenchman Costes expressed the views that the purely practical results of all past ocean flights had been absolutely nil; that the establishment of a regular commercial trans-oceanic service could be expected only in the distant future, since present equipment was unsuitable; and that trans-oceanic flights with present-day airplanes should be prohibited. The last-mentioned proposal was opposed by Air Minister Balbo on the ground that the few men who had already crossed the ocean must not establish themselves as guardians of their fame, but should allow youth the opportunity to accomplish still more.

The North Atlantic Commission, after extended deliberations, came to the conclusion that for commercial flights three routes should be given consideration, viz., the northern route via Greenland, the central route via Ireland and Newfoundland, and the southern route via the Azores and Newfoundland.

JUST AMONG OURSELVES

Motor Stocks Lead Way Down

THE price of seven important motor stocks showed a decline of 33.8 per cent in June, by far the largest percentage decline of any industry group for the same period, according to a compilation made by Frazier Jelke & Co., New York.

Every group went down, to be sure, but the nearest to the automotive drop of 33.8 per cent was the amusement group, which sloughed off 22.6 per cent. Steel group decline was 13.4 per cent; equipment group, 10.7 per cent; and oils, 8.6 per cent. Best record for the period was made by the chemicals, which declined only 0.4 of a per cent.

Average for all groups was 1.5 per cent decline.

Automobile men will be glad when the time comes once more when we can leave reverse leadership of this kind to somebody else. Maybe we'll be able to do better before the year is out.

Used Car Profit News in June

SOME figures just came to us yesterday that seemed to us to be just as much news as if the fabled man had bitten the dog. They were figures on used cars sold during the month of June, 1932, by an individual dealer. The 30 used cars which he sold, he had taken in for approximately $6,500 and sold for $7,250. In other words he had almost enough to cover his selling cost in this particular instance.

Profit on a used car operation is news almost any time, but it seems to us to be striking news—even for a month's period—in June, 1932. How did he do it? Only explanation we could get was: "Bought them right, had exceptional merchandise in the new car, and advertised."

"Seasonal Selling" Idea by Chevrolet

EACH month Chevrolet field men are provided with lecture material on special truck equipment designed for vocations whose buying season is about to begin. The idea is to get dealers to concentrate their merchandising fire on specific vocations at specific times; to contact the truck prospect, in other words, just at the time he is most likely to be in the mood for buying.

Seems to be a sort of amplification of the regular vocational selling idea and should have good possibilities. Might even find application in sale of other types of automotive products.

New Truck Units Make Dobbin a Dud

DEVELOPMENT of house-to-house delivery units by truck manufacturers has been very rapid in the last year or two. Three or four years ago the only units of this kind available were those made by one or two companies devoted exclusively to the production of such vehicles. Today a number of standard truck makers have delivery units as part of their line, in some cases manufacturing the whole unit themselves, in others simply adapting their chassis to accommodate a special body for this type of work.

Chevrolet was added to the list of truck companies in the house-to-house field about a month ago when it announced its Montpelier Side Aisle Retail Delivery Unit at $950 f.o.b. The Chevrolet job consists of a 131 in. Chevrolet truck chassis cut down to 115 in. and a drop in the chassis frame to the driver's position to permit the operator to drive while standing.

At least three more truck builders, in addition to those already in this field, are expected to enter the house-to-house delivery competition within the next six months or a year. It looks as though old Dobbin were going to be ousted from his last stronghold in the commercial transportation field.

August Sales Will be —— ?

PROBABLY a little early to start talking about August business prospects, but we've just completed a few guesses which somebody else may be interested in. Passenger car sales seem likely to record a seasonal drop as usual, although there are some indications that, in total, it won't be quite as large proportionately as usual. Our present guess is that new car sales in August will run around 120,000 units, which will be under the probable July total by 8 or 10 per cent and under August of last year by something like 20 to 25 per cent. There are already indications that Ford has pretty well caught up with his back orders.

Guessing truck totals is even more hazardous, but August seems likely to produce something like 18,000 commercial vehicle sales, which would be about 33 per cent behind August of 1931.

Time will tell how good these guesses are.—N.G.S.

Finds Synthesis Improves Oil Products

In this paper the author, who is connected with the Universal Oil Products Company of Chicago, reviews recent changes in the oil industry, most of which have been brought about by changes in the demand for petroleum products emanating from users of automotive equipment.

The paper was read before the Petroleum Division of the American Institute of Mining and Metallurgical Engineers at a meeting in New York City some time ago. The paper has been slightly condensed.—Editor.

REFINING of crude oil is dependent upon sound economic principles to a greater extent than ever before in the history of the oil industry. This is due to developments in the automotive, airplane, electrical, machine and powerplant industries, all demanding better products, such as gasoline, lubricating oils, and fuel oils.

Today's refiner must produce motor fuels, lubricants and other products of higher quality and more exact specifications than were produced in the past, and at the same time reduce his operating costs to a minimum, if profit is to be shown. Petroleum refining, then, has become truly a manufacturing industry. In previous years "refining" was almost a misnomer, because, as practiced, it was merely a matter of separating the various constituents of crude oil and selling most of them without any degree of change.

Today we are face to face with an entirely different situation. The gasoline of former years, otained from crude oils by simple distillation, is no longer suitable for our modern automobiles, much less for our aircraft. Likewise, the newer of engines demand superior lubricating oils.

It used to be the primary practice of refiners, after removing gasoline, kerosene and gas oil from the crude, to sell the residue remaining in the still for what it would bring as "fuel oil," and for many years it did bring enough to make refining a profitable operation. Today, however, the picture is changed. It is no longer possible, to any great extent, to sell residual fuel oil at a price which makes profit possible.

The development of the cracking process is the dominant factor which today is transforming the refining industry to meet these new consumer demands and new economic conditions.

The demand for gasoline is ever increasing, particularly that for gasoline of high anti-knock properties. Straight-run gasoline, averaging about 55 octane number in the United States, is not suitable for the modern motorcar. It detonates to a degree which means loss of power and harsh running of the engine. Straight-run gasoline is now definitely a third-grade product, and is sold as such.

Cracked gasoline, on the other hand, averages about 72 octane number, and will operate modern motorcars in a satisfactory manner.

It is significant that straight-run and natural gasoline production is decreasing, while production of cracked gasoline continues to increase. This is clearly shown in the table, which gives the daily production of straight-run, cracked and natural gasoline in the United States during the last seven years:

	Gasolines (Bbls. per day)		
	Straight-run	Cracked	Natural
1925	469,000	187,000	73,500
1926	488,000	257,000	88,500
1927	539,000	277,000	106,000
1928	599,000	335,000	116,000
1929	671,000	394,000	142,800
1930	647,000	432,000	147,200
1931	613,500	488,000	110,500

It is to be remarked that the production of both straight-run and natural gasolines, as compared with the cracked product, decreased during the year 1931, while the amount of straight-run gasoline dropped during the year 1930 as well. Cracked gasoline, on the contrary, has shown a steady increase through the years.

Gasolines of today are sold on an octane rating. The Chicago *Journal of Commerce* in its Feb. 3 issue quotes the market values of gasolines as a function of their octane numbers:

Gasoline (Cents per Gallon)	
U. S. Motor, below 57 octane	3 @ 3¼
U. S. Motor, 57-64 octane	3½ @ 3¾
U. S. Motor, 65 and up octane	3⅞ @ 4
60-62 437 end point	3⅛ @ 3¼
60-62 400 below 57 octane	3¼ @ 3½
60-62 400 57-64 octane	3¾ @ 3⅞
60-62 400 65 and up octane	4 @ 4⅛

Cracked gasoline, the synthetic product, is superior to its straight-run counterpart and brings a premium price, based upon its octane number. The price differential between some straight-run and cracked gasolines from the same crude oil is about 2½ cents per gal. Still other straight-run gasolines are so valueless as motor fuel that they are being cracked into gasoline of high octane number.

The dominant synthesizer in the oil industry is the cracking process. It is producing primarily gasoline, fuel oil, gas and coke, with some lubricating oils, road oils and asphalt.

Years ago, when the cracking process was in its infancy, the refiner used to "sneak" cracked gasoline into straight-run, in the belief that it was an inferior product. The facts have shown the opposite to be true, and now he tries to "sneak" some straight-run into his cracked gasoline.

The cracking process is converting not only naphthas, kerosene, gas oil and fuel oils, but also straight-run gasolines and entire crude oils into high yields of high octane number motor fuels.

Fuel Oils

Nor is the cracking process limited to the production of synthetic gasoline. Modern fuel oil is another of its products. Formerly fuel oil was the residue left after gasoline, kerosene and gas oil had been distilled from the crude oil, and this still holds to some extent. This residue is often very viscous and difficult to transport, especially at low temperatures. Moreover, its use for fuel is contrary to the principle of economy, for natural fuel oil is capable of being converted by the cracking process into high yields of motor fuel as well as into high-grade fuel oil.

When cracking is not used to the fullest possible extent, fuel oil is produced in such volume as to flood the market, bring no profit to the refiner, and result in economic waste of a great natural resource.

Modern fuel oil, a product of cracking, is a synthetic product. It is superior to the fuel oil produced by atmospheric pressure distillation, being lower in viscosity and pour point and higher in thermal units per barrel. And again, the synthetic product sells at a premium which, in some parts of the country, is as high as five cents per barrel. By regulation of the cracking process, it can be manufactured to conform to any market specification varying from light furnace or Diesel oil to heavy oil for commercial fuel or ocean liner use, or viscous residuum for refinery fuel. Moreover, the amount produced may be regulated according to market demand, avoiding over-production.

Cracked fuel oil, then, is a controlled manufactured product.

An interesting series of general comparisons between cracked and straight-run fuels, or, in other words, between synthetic and natural fuels, may be summarized into six points:

1. Cracked fuel is a manufactured product, and can be made substantially the same irrespective of the original charging stock. Straight-run fuels are residues and vary with the crude, the type of operation, etc.
2. Cracked fuels being heavier than straight-run fuels (4-10 A.P.I. vs. 12-24 A.P.I.) contain, on an average, 10 per cent more heat value per gallon.
3. Cracked fuels have lower cold test and, therefore, will flow more freely in cold weather.
4. Cracked fuels have lower viscosity and, therefore, require less steam or less power for atomization.
5. Cracked fuels have a flatter viscosity-temperature curve at temperatures above 120 deg. F. This means steadier operation with slight variations of oil temperature as it affects the viscosity and, therefore, the amount of oil passing through a given valve setting.
6. Cracked fuels are also used as a blending material for natural fuel oils.

Lubricating Oils

Our era of synthesis, however, does not limit itself to fuels but extends significantly into the related field of lubricants.

The higher rates of speed and greater distances which cars travel, the rapidity of the moving parts in modern high-speed engine, and the use of cars irrespective of atmospheric temperatures, all put new and greater demands upon lubricating oils and make exacting requirements of the manufacturers of motor oils. Oils more resistant to high temperature operation and less subject to viscosity changes with temperature are needed. To a limited extent nature can supply the need if lubricant stocks are carefully selected, but modern science must make up the deficiency with a synthetic product.

Lubricating oils are already being synthesized on a commercial scale by the hydrogenation at high temperatures and pressures of various petroleum oils. It is reported that 5000 barrels per day of such lubricating oils are being produced and it is claimed that these oils are resistant to breakdown under severe conditions of lubrication at elevated temperatures.

Another source of synthetic lubricating oil which is being applied on a commercial scale, is the polymerization, by means of aluminum chloride, of unsaturated hydrocarbons derived from cracking. Synthetic oils, suitable for lubrication under severe conditions of temperature and speed, have been obtained by this method from various cracking stocks.

Synthetic lubricating oils are manufactured products controlled to fulfill the service conditions required of them.

Asphalts and Road Oils

Asphalts are not new in the field of synthesis, for they have been produced for years by methods such as treatment with sulfur, blowing with air, and by the cracking process. Here again the "manufactured" product has been put to many uses for which natural asphalt is unsuitable, while its properties are so controllable as to make it quite as useful as the natural product for other purposes.

Road oils are also being produced synthetically and are used in many different states of the Union.

Gases

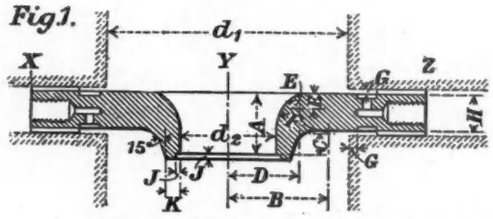
Another product from the cracking process finds a two-fold place as synthetic material. Gas from the cracking process, used as fuel in the refinery for a long time, has proved to be excellent raw material for the manufacture of alcohols and other synthetic chemicals. As a synthetic domestic fuel, however, refinery gas has found an even greater opportunity. Both natural gas and manufactured gas, as domestic fuel, have been steadily increasing in consumption over a long period of years; and both these fuels can be matched by "reformed" refinery gases. The "reforming," i.e., the cracking, of gases can be regulated to produce a synthetic fuel of controlled calorific value and gravity.

Coke

The cracking process as a synthesizer supplies still another product which has found numerous satisfactory uses. Petroleum coke has been sold in increasing amounts as raw material for carbon products such as electrodes, abrasives, artificial graphite, etc., and as a reducing agent in several industries. In the field of synthetic fuels, petroleum coke takes its place as a low ash product for use in refineries, in industrial plants, in locomotives, and as a domestic fuel.

British Standardize Nozzles For Measuring Air-Flow

Standardization Work in England Results in Recommendation of Design and Specifications for Use in Engine Testing



Section of air-flow measuring nozzle.

A SUB-COMMITTEE of the Standing Committee on Heat-Engine Trials of the Institution of Civil Engineers (Great Britain) recently made a report dealing with some work done by it in connection with the standardization of nozzles for measurement of air flow. The nozzle recommended in the report, of which a sectional drawing is shown herewith, has a parallel throat, which facilitates accurate reproduction. The basic dimension is the throat diameter, and to this the other dimensions bear the proportions given in the following table:

Dimensions of	Standard Nozzle in Terms of d_2	Dimensions of	Standard Nozzle in Terms of d_2
d	1	G	0.05 minimum
A	0.605	H	0.35 maximum
B	0.83	J	0.033
C	0.30	K	0.083
D	0.75	d_1	2.25 to 2.50
E	0.20	Θ	10 to 80 deg.
F	0.33		

The approach pipe is to be straight and not less than 20 nozzle diameters in length, while its diameter is to be between two and two and one-half times the throat diameter. It need not be smoother than an ordinary commercial finish, and in large sizes it may be riveted.

The air supply is to be taken from a receiver through a control valve by which its pressure is to be reduced to one not much in excess of the atmosphere. A honeycomb is to be fitted between the control valve and the pipe to insure an eddy-free flow in the latter. The nozzle is to discharge into the atmosphere, but to be shielded on the down stream side by a pipe similar to the approach pipe, but in this case 10 throat diameters long. The air temperature will be measured in this pipe at a point distant from the nozzle by four throat diameters. The depth of the thermometer pocket must be sufficient to insure that it is the air temperature and not the pipe temperature which is being measured, but in the case of pipes more than 8 in. in diameter the pocket need not be deeper than half the throat diameter. The pressure difference is to be measured by a double leg manometer coupling up the orifices Z, X, shown in Fig. 1. An additional manometer is to be provided both upstream and downstream of the nozzle to give the absolute pressure of the air. For all commercial purposes, the humidity of the air may be ignored. Nozzles with throat diameters of more than ½ in. are suitable for pressure differences from 0.4 in. to 40 in. of water. The approximate diameter of the nozzle required can be obtained from the formula $d_2 = \frac{1}{12}\sqrt{\text{discharge in cu. ft. per min.}}$

In tests the discharge in lb. per second is to be calculated from the formula

$$Q = 0.1148\, M\, \Omega\, \delta\, \sqrt{\Delta}\, d_2^2\, \sqrt{h}\, \sqrt{\left(\frac{m_2}{T}\right)} \text{ lb. per sec.}$$

where the symbols involved have the following significations:

Q = quantity discharged per unit of time, lb. per second.
h = observed head, inches of water.
T = absolute temperature.
= observed temperature (t deg. F.) + 459·6.
m_2 = absolute pressure, downstream side, inches of mercury.
d_1 = diameter of pipe upstream, inches.
d_2 = diameter of nozzle, downstream, inches.

$$n = \left(\frac{d_1}{d_2}\right)^2$$

M = coefficient for velocity of approach.

$$= \frac{n}{\sqrt{(n^2 - 1)}}$$

$$= 1\,\frac{1}{2\,n^2} \text{ approximately for } n \text{ greater than } 4{\cdot}5.$$

δ = compressibility factor.
Ω = coefficient of discharge of nozzle.
= specific gravity of gas relative to dry air at the same temperature and pressure.

For all nozzles used under the specified conditions the value of the product $M\,\Omega\,\delta$ is to be 0·995.

The equivalent discharge in cu. ft. per minute at standard temperature (60 deg. F.) and pressure (30 in. of mercury) will be 785 Q. At any other temperature and pressure it can be deduced from this value by the usual gas formula.

Cetene-Number Scale Established For Diesel Fuel Characteristics

THE same as the anti-knock qualities of gasolines are now expressed in octane numbers, so the smooth-burning qualities of Diesel-engine fuels are to be expressed in cetene numbers, according to a proposal by G. D. Boerlage and J. J. Broeze, of the engine-research laboratory of the Bataafsche Petroleum Co., Delft, Holland.

The cetene number of a Diesel engine fuel is the proportion of cetene ($C_{16}H_{32}$) in a mixture of cetene and mesitylene (C_9H_{15}) which when used in a Diesel test engine gives the same difference in ignition delay as the sample fuel at maximum compression pressure of 15 and 30 atmospheres, respectively.

In conducting the test, the engine is run for 8 to 10 minutes on each sample fuel at a low load, four sets of throttled diagrams being taken. These throttled diagrams are pressure-time diagrams, made successively with the throttle in different positions. In these diagrams the ignition point is indicated by the point where the combustion-pressure curve deviates from the compression-pressure curve. A curve is drawn through the ignition points on all of the throttled curves, and from this curve the ignition delay at 15 and 30 atmospheres compression pressure can be readily determined.

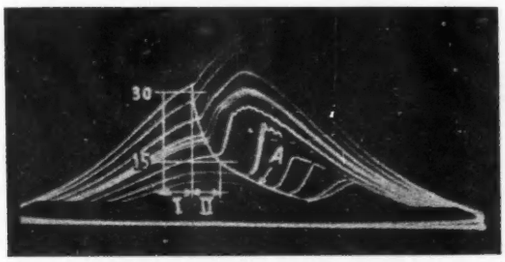


Fig. 1—Indirect measurement of delay period
In the series of throttled diagrams *A* is the delay line. The delay at 30 atmospheres, shown at I, is practically as long as the difference of delay period measured at 15 and 30 atmospheres respectively, shown at II

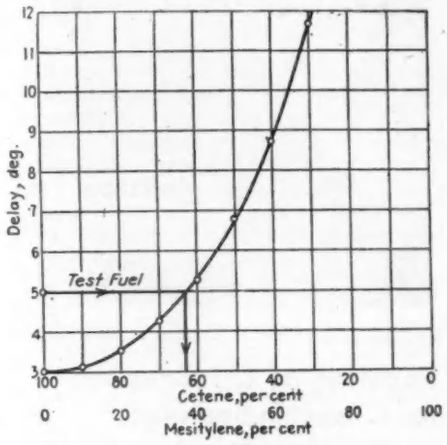


Fig. 2—Rating of a fuel in cetene numbers
The result of a measurement is plotted against a curve obtained from reference mixtures. The cetene number is then obtained graphically

Next a sufficient number of mixtures of the standard fuels are tested to make it possible to obtain a smooth curve of the relation between the cetene content of the mixture and the difference in ignition delay at 15 and 30 atmospheres. Such a curve is shown in Fig. 2. From the results of the test on the sample, the cetene number can then be read off from this chart.

For routine tests, secondary standard fuels have been adopted, and a conversion curve has been worked out which makes it possible to convert the result obtained with these fuels into cetene numbers. It is stated that by this method the cetene numbers of a dozen fuels can be determined in a day.

Finds Anti-Knock Better Than Kerosene

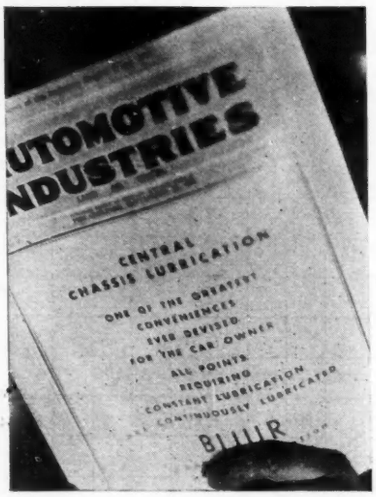
TESTS with anti-knock gasolines in tractor engines altered to work with a higher compression ratio, made in the Detroit laboratory of the Ethyl Gasoline Corp., indicate that such fuels can now be used more economically than kerosene in farm tractors.

The tests are said to have shown that a kerosene-burning tractor which will pull two 16-in. plows in ground-breaking operations, when suitably altered and operated on anti-knock gasoline, will pull three 16-in. plows at a speed 7 per cent higher.

Another thing tending to favor the use of anti-knock fuels in farm tractors is that the cost of kerosene is rising, due to the shrinking demand and the consequent increase in the cost of distribution.

On the other hand, twenty-six of the thirty-eight states levying a tax on gasoline refund same if the fuel is used for agricultural purposes. According to a survey made by engineers of the Ethyl corporation, 82 per cent of the tractors designed to use kerosene are now being operated on gasoline.

IN an article in *World Petroleum* entitled "Needs of Automobile Engines Dictate Design of Refinery Equipment," Gustav Egloff states that, since cracked gasoline has a much higher anti-knock value than straight-run, the demand for the former product has become so insistent that even straight-run gasoline is being cracked today to improve its anti-knock value, and then blended back with the gasoline obtained by cracking the topped crude. A still more recent development is the cracking of crude oil direct, whether of high or low gasoline content, eliminating the skimming step altogether, and producing direct from the cracking unit a finished gasoline of high volatility and a knock value equal to and in some cases better than that of ethyl standard.



The Forum

Location of Oil Grooves for Crankpin Bearings

Editor, AUTOMOTIVE INDUSTRIES:

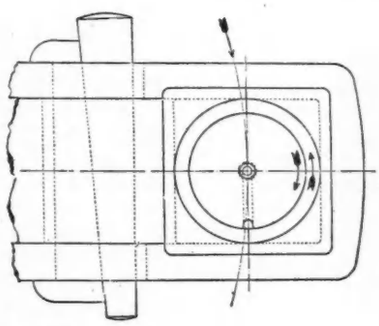
Referring to the discussion on page 18 of *Automotive Industries*, July 2, 1932, it seems almost strange that there should still be any open question as to where the oil grooves should be placed in a crank bearing of a reciprocating engine.

Something over 30 years ago the writer was consulted in a matter of bearing troubles on a large pumping engine. After the bearings were taken apart the cause of the trouble was altogether evident—an excess of oil grooves. New bearings were made without any oil grooves and a single groove was cut in the crankpin and the lubricant supplied through the crankpin instead of a wiping device used before. The construction is illustrated on pages 4 and 5 of the enclosed reprint of a paper presented by the writer to the A.S.M.E. in 1919. The results in this case proved phenomenal and in all these years the writer has not found a single case where this construction was not an improvement over all other existing methods.

C. H. BIERBAUM.

We produce the illustration in the A.S.M.E. paper referred to herewith. The description accompanying this illustration is as follows:

"Fig. 1 represents a theoretical ideal, as well as practical and efficient, method of lubricating a crankpin bearing, the journal receiving oil through the crankpin. The rotation of the crankshaft is in the direction indicated by the upper arrow, and in the position shown the engine is on a dead center at a point of reversal of pressure. The direction of relative motion of the rubbing surfaces is shown by the two arrows at the right of the figure. The oil film enveloping the right half of the crankpin has been completely restored during the stroke just finished, since the oil groove passed over this half of the bearing while no pressure was being exerted upon it. After the dead center has been passed, the entire pressure is then exerted upon the crankpin with its fully restored oil film, and at the same time the oil groove wipes over the other half of the bearing and restores its oil film while no pressure is being exerted upon it, after which it in turn is ready to receive a reversal of pressure upon a fully restored oil film. Thus both halves of this crankpin bearing present alternately, for the maximum pressure of each stroke, a complete and uninterrupted surface for maintaining the film on an area equal to the projected area of the crankpin, but it is impossible to obtain so perfect a condition of lubrication in a bearing having the old-fashioned cross oil grooves which are still too often found in this class of bearing."



The above evidently refers to a horizontal double-acting steam engine in which the pressure on the crankpin is supposed to be in line with the momentary steam pressure on the piston. In high-speed gasoline engines provided with pressure lubrication through the crankshaft the oil hole in the crankpin is never located as shown in Fig. 1 but extends radially outward from the crankshaft axis. The reason for this is that in a four-cycle engine in which there is only one power stroke in four, the loads on the crankpin are more dependent on the inertia forces than on the gas pressure, and the inertia force load on the crankpin is always substantially in the direction of the crank arms, so that the outer side of the crankpin is free of load.—EDITOR.

Schliha Two-Stroke Design

Editor, AUTOMOTIVE INDUSTRIES:

The criticism of the above design in the issue of July 2 by James McIntosh is in itself not above criticism. The Schliha two-cycle aviation engine is a newcomer in the field and as such entitled to be called "new," even if the Patent Office reveals a lot of patents of 30 or 40 years ago on truncated piston engines.

It is true that the piston diameter is some 15 per cent larger than the conventional type for the same effective area; still the wall area of the combustion chamber is more favorable and smaller than that of an L-head poppet valve engine. But the larger piston results in increased crankcase suction for the intake and more effective crankcase compression for the charge transfer. The exhaust-inertia conditions may appear hopeless to the layman, but no two-cycle specialist would give these inertia forces full play. On the contrary, it is advisable to provide a brake against too free an exit of the exhaust into the atmosphere, as this results in an increase of power and—for carburetor engines—lower fuel consumption.

Uniflow Principle Important

The first requirement for a successful two-cycle engine is the uniflow principle. In the Junkers engine "uniflow" is obtained by the use of two pistons, three connecting rods and three throws of the crankshaft for each cylinder. The truncated piston accomplishes the same result in the most simple manner, and at the same time eliminates the weak spot of most two-cycle engines, the hot spot in the center of the piston head. The ring-shaped piston head is most effectively cooled by a steady flow of fresh mixture, which thoroughly scavenges the entire combustion chamber and cools the spark plugs. It is impossible to make this type of engine "four-cycle."

Since crankshaft and crankpins have roller bearings, and cylinders are lubricated by oil added to the fuel in the proportion of 2½ to 3 per cent, there is no uneven oiling. Piston and extension represent of necessity such a large bearing area that lateral unit pressures become negligible.

Schlihas Are Responsive

Schliha's truncated-piston engines have been used in one and two-cylinder units for motorcycles and other purposes by the thousand, and develop well over a horsepower per cubic inch displacement at speeds below 5000 r.p.m., in their water-cooled models. They readily respond to the throttle and have idling and low-speed characteristics nearly as good as four-cycle engines.

The danger of one-cylinder pirating in a two-cylinder opposed two-cycle

engine is not so serious, as proven by a few hundred thousand outboard engines now in use in this country, all of the two-cycle type.

In new merchant marine equipment, as well as stationary powerplant units up to 15,000 hp., the two-cycle engine predominates. For automotive purposes, and particularly for aviation, the two-cycle engine with fuel oil injection and electric ignition has not only a place but a distinct future.

JOSEPH SCHAEFFERS.

"Engineering Legerdemain" Ideas Are Suggested

Editor, AUTOMOTIVE INDUSTRIES:

In Mr. Shidle's article, *The Little Giant* (May 28, '32), he says, "One of the big manufacturers may, through some engineering legerdemain . . . find some way of producing a car for $300 or $350 which will compare favorably in size and performance with current low-priced cars. For such a car an assured market would seem to be waiting."

Would Mr. Shidle consider any of the following ideas (for which no novelty is claimed) "engineering legerdemain"?:

1. In a fully streamlined car the required horsepower can be considerably reduced, permitting a smaller, cheaper, and lighter powerplant and a lighter car. (Do not read "small" for "light"; a full-sized body is intended.)

Cheaper Engine Practicable

2. With a rear-mounted engine comparatively easy to insulate almost completely from the passenger compartment, a noiser (cheaper) engine can be used, a cheaper body almost devoid of insulation in itself, a cheaper frame, if any, in the ordinary sense. There is also a possibility, which would enrage Mr. Stout, of setting up an air-cooled engine, if it were cheaper, in the air stream coming over the roof.

3. Individual wheel suspension, at least in front, can reduce cost. An extremely simple and cheap hook-up is possible, as the writer envisions it, on a very light car. Such suspension may permit the use of a cheap reversible steering gear, most vagaries of one front wheel being resisted by the other. Such a car can ride very well.

4. Abandonment to some extent of the armor-plated, shockproof characteristics of the present body can reduce both weight and cost.

Upsets Normal Ratio

The one sacrifice such a car might entail on the public comes under No. 1. Cutting down the required horsepower at high speed may cut down the power available at any speed to such an extent as seriously to disturb the normal power/weight ratio. In this case a fast next-to-top gear would give excellent performance, but the public would have to shift gears. (Heaven knows it has been made easy enough!) Indeed, would it not be worth the effort to point out to the still, but not necessarily forever, apathetic public to what extent a car's cost can be reduced if the public will forego its gadgets (even to crank-operated windows) and chromium plate, if it will shift gears, if it will free-wheel for longer life, and if it will resolutely refrain from counting cylinders?

LAURENCE E. CROOKS,
Northampton, Mass.

Nikolaus Otto, Engine Designer, Honored at Centenary Celebration

ON June 14, the centenary of the birth of Nikolaus Otto, the pioneer of the internal combustion engine, was celebrated at Cologne. Otto's place among the principal pioneers of the internal-combustion engine is an assured one, for firstly by his invention of the atmospheric gas engine and secondly by his successful application of the four-stroke, or "Otto" cycle of operations in gas engines, he gave the world its first efficient engines using combustible gas as the working medium and, moreover, paved the way for the work of later inventors whose labors have led to the construction of internal-combustion engines in countless numbers for use at sea, on land and in the air. His work was also of great importance in furthering the advance of engineering in Germany, and he became one of the founders of the world-famous firm Gasmotorenfabrik Deutz, A.G., now known as the Humboldt-Deutzmotoren A.G., of Cologne.

Born on June 14, 1832, Otto died on January 26, 1891, at the age of fifty-eight. In his early surroundings there was little calculated to stimulate his latent inventive powers, for his birthplace was the little country town of Holzhausen, in Nassau, and after attending the local schools he began a commercial career in Cologne. The turning point in his life came when his attention was drawn to the early gas engines, and especially those of the French inventor, J. J. E. Lenoir (1822-1900), constructed in the early 'sixties. Lenoir's engines were a great advance on any previously made, but they were still extravagant in fuel consumption. Considering it, perhaps, possible to make gas engines capable of competing with steam engines, Otto began experimenting, and during 1861-64 took out patents in various countries for a vertical atmospheric gas engine in which the free piston was driven to the top of the cylinder by the explosion of the gas, and then descended owing to its weight and the pressure of the atmosphere. Through this invention, Otto, in 1864, was brought into contact with the engineer Eugen Langen (1833-1895) with whom he founded the manufacturing firm of N. A. Otto and Company.

The next important step in the history of the firm came with the sucess of Otto in applying the four-stroke cycle of operation to gas engines. A horizontal engine embodying this principle was made in 1876, a German patent secured on August 4, 1877, and a four-stroke engine exhibited at the Paris Exhibition of 1878 more than repeated the success achieved by the atmospheric engine eleven years earlier. Subsequent litigation showed that Otto had been forestalled in many of his ideas by earlier inventors, notably by the Frenchman, Alphonse Beau de Rochas, who in 1862, described a four-stroke engine, but nothing can detract from the merits of Otto as being the first to achieve success where others had either failed or had left their experiments uncompleted. From 1878 onwards, the Otto high-speed "silent" gas engine, as constructed by many firms, became recognized as one of the most efficient prime movers, and for certain work the successful rival of the steam engine. The present state of efficiency of the internal-combustion engine is due to the work of a very large number of inventors, but looking back it may be said that the work of Otto is the great landmark which connects the earlier inventions of Street, Brown, Barnett, Bassanti, Matteueci, Lenoir and Hugon with the later developments due to Clerk, Robson, Priestman, Daimler, Akroyd Stuart, Diesel and many others.—*Engineering.*

Sleepless Nights Ahead for Engineers

(*Continued from page 71*)

manufacturer, and the other by a passenger car maker, both in cooperation with makers of "doughnut" tires, agreed upon importance of steering among the problems involved in applying "doughnut" tires.

In one test cars were driven with tire pressure in "doughnuts" starting at 25 lb. and the pressure was decreased progressively in succeeding tests to 15 lb. Test crews reported steering effort in parking increased as pressure was reduced. They also reported that kickback on the steering wheel rim increased as pressure was reduced, that there was danger of over-steering by drivers not accustomed to the new tires and that there was a definite increase of resistance in steering around corners.

Brake Space Reduced

The other test resulted in the observation by the engineer in charge that "they paid no attention to what it (low-pressure balloon tires) would do to steering." His reaction after a run in a test car was that it was almost impossible to park or to move the steering wheel when the car was stationary, that the steering in general was sluggish when going into or coming out of turns.

Dimensions of "doughnut" tires crowd the space available for brakes. F. L. Main, sales engineer, Kelsey-Hayes Wheel Corp., defending brakes, said that many brake problems cannot reasonably be attributed to brake drums, and Chris Bockius, Raybestos-Manhattan, Inc., states, "In looking at the horizon it is apparent that the design of brakes will undergo a radical change, especially for the heavier cars, due to the smaller size of rims required by coming development in tires, which may limit drum diameters to 13 in., or at the most 15 in. If such a trend in design is coming for the larger cars, may not 10-in. diameter drums or less be applied to the lighter cars possibly for economic reasons solely?"

Austin Wolfe boldly predicted at White Sulphur "that the service brake will have to be removed from the rear axle for lack of sufficient space, and to take unsprung weight away from the axle. Then the propeller shaft brake will be the proper type to use and it could be built into a unit with a free-wheeling device."

Better traction, which is generally admitted as one of the advantages of "doughnut" tires, gives increased braking possibilities and, therefore, will impose greater stresses on brake mechanisms. Figures for coefficient of friction between tire and road do not apply to the large ground contact areas of "doughnut" tires. The tire actually envelopes road inequalities and resistance to sliding wheels when brakes are applied, partakes of the nature of gearing rather than of plain friction.

If this condition is employed to bring about exceedingly rapid deceleration, it is obvious that exceedingly high braking torque may be developed. During an informal talk about "doughnut" tires recently, it was mentioned that in one of the early tests of "doughnut" tires, a front axle was actually twisted loose from its anchorage on the front springs by a harsh brake application.

The same quality of "doughnut" tires which gives them greater traction also improves their resistance to skidding and makes it almost impossible to spin them. Because of this characteristic some of the stresses on tires formerly harming them will be transferred to other parts.

Eye Appeal and Comfort

Style and a better ride are two advantages claimed for "doughnut" tires by their advocates. Engineers forced to draw conclusions about the future of "doughnut" tires realized that the former is difficult to evaluate but riding quality can be more easily compared. As a result of much comparing, they generally agree that the "doughnut" tire is far superior for riding over a series of railroad ties, surmounting curbs at high or low speeds and for getting across really bad bumps and holes. For ordinary conditions the "doughnut" tire is not rated so highly. One engineer says that "doughnuts" are no worse than ordinary balloons, a second says that good riding cars are not improved by "doughnuts" and a third says that the "jiggling" ride is definitely poorer than on standard balloons.

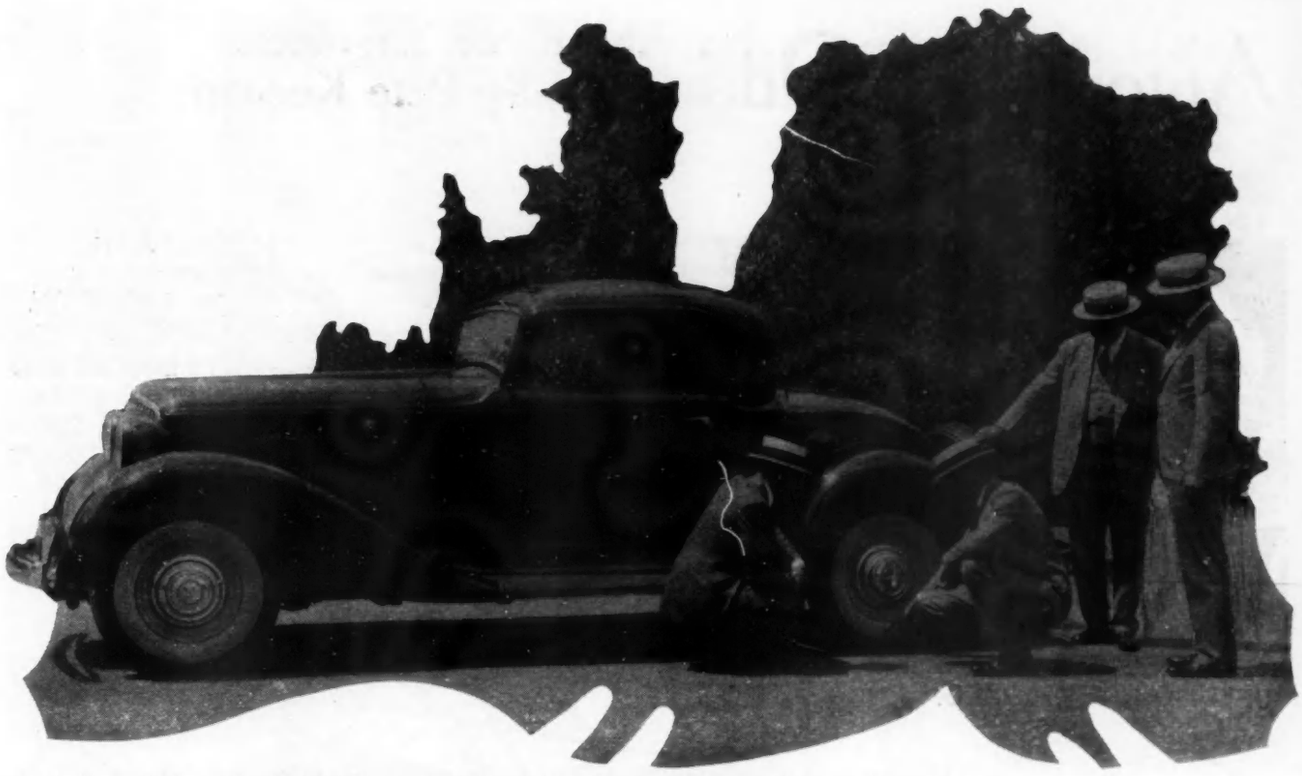
A very rapid retardation to which the description "throwing out the anchor" has been applied is reported by several transportation men who have tested the tires over bad stretches of road. A fleet man who had the presence of mind to keep his eyes on the speedom-

Experimental Practice, Low-Pressure Balloon Tires for Passenger Cars, Load and Inflation Table, Tire and Rim Association

Min. Infla.	6.00		6.50		7.00		7.50		8.25			9.00			9.75	
Press.	15	16	15	16	15	16	15	16	15	16	17	15	16	17	15	16
16	560	585	665	695	770	805	875	915	985	1025	1070	1090	1135	1185	1195	1245
17	595	620	705	735	815	850	925	965	1040	1080	1130	1150	1195	1245	1260	1310
18	630	660	745	780	860	900	975	1020	1095	1140	1190	1210	1260	1310	1330	1380
19	665	695	785	820	905	945	1025	1070	1150	1195	1250	1270	1320	1375	1395	1445
20	700	735	825	865	950	995	1075	1125	*1205	*1255	*1310	1330	1385	1440	1460	1515
21	735	770	865	905	995	1040	1125	1175	1260	1310	1370	1390	1445	1505	1525	1580
22	*775	*810	*905	*950	*1040	*1090	*1175	*1230	1315	1370	1430	1450	1510	1570	1590	1650
23	...	....	....	....	.....	.....	.....	.....	1370	1425	1490	1510	1570	1635	1655	1715
24	...	....	....	....	.....	.....	.....	.....	†1425	†1485	†1550	†1570	†1635	†1700	†1720	†1785

NOTE: * Maximum Loads for 4-Ply Tires
† Maximum Loads for 6-Ply Tires
This table not to be used for buses or trucks

Adopted May 13, 1932.



A Graham Eight with 7.50/15 tires. Left to right: Dr. B. J. Lemon, field engineer; C. L. Moody, factory manager; S. P. Wacher, technical department; all of United States Rubber Co., and Louis Thoms, chief engineer, Graham-Paige

eter while the car was going over an exceedingly rough spot in a paved road reports that the speed dropped five miles an hour. Of course, this action is not of prime importance because car owners do not habitually traverse rough roads at high speeds—even with currently large engines.

How air pressure can be maintained in "doughnut" tires within limits of a pound or two when the variation in pressure inside the tire because of heating amounts to several pounds, and how car owners are to be trained to check inflation pressure within a pound every few days, is one of the problems for which engineers do not foresee an early solution. A solution must be found because riding comfort, inflation pressure and tire life are closely related in "doughnut" tires to a greater extent than with other tires.

Tests made with tires running at a deflection of 22 per cent show abnormal treadwear, at 18 per cent deflection tread service was equal to that of standard tires. Maintaining accurately any deflection determined upon will be difficult because the larger tube area of the "doughnut" allows more air seepage than the standard tube.

Cost per mile for riding on "doughnut" tires at present prices for replacement or as optional equipment is higher than for standard balloon tires. The major factor in this figure is the fact that "doughnut" tires are new, prices are not favored by large scale production.

There seems to be general agreement that the cost per mile will not be less than for balloon tires, at least not in the near future. The strongest advocates of "doughnut" tires do not claim greater mileage for "doughnuts" than for standard balloons.

Timken Announces New Brake Lining

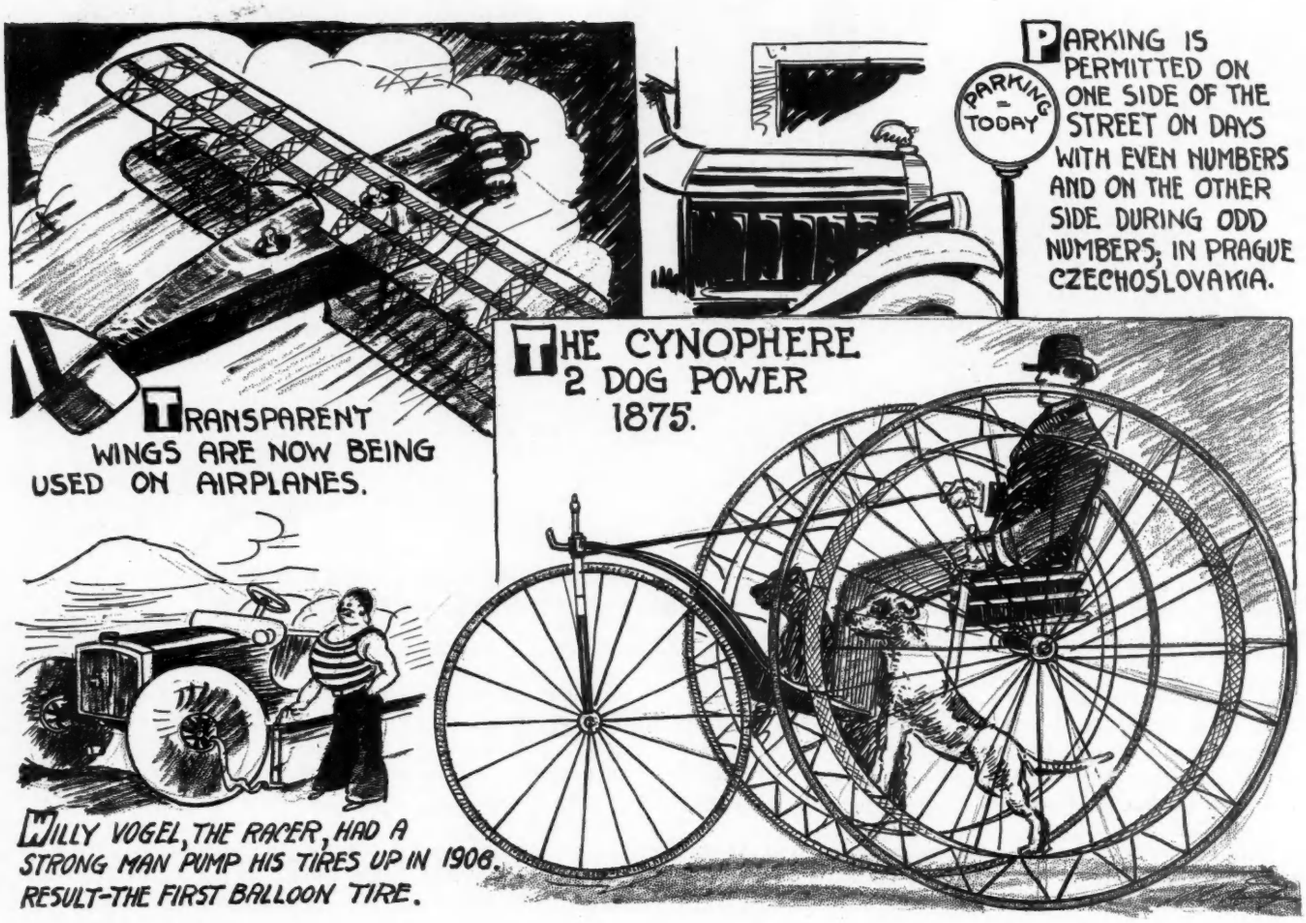
ITS entrance into the replacement brake liner field is announced by the Timken-Detroit Axle Co. The brake liner which has been developed by Timken is designed specifically for application to heavy-duty trucks, trailers and motor coaches.

It is of course of the molded type, but in design and manufacture, as well as in the sales policies, interesting departures from the conventional have been made. The liner proper is molded over an expanded steel foundation sheared from flat stock and shaped so that the steel strips lie at an angle rather than perpendicular to the liner surface, adding to the bond and strength of the completed unit.

Into the steel reinforcement before molding are placed threaded anchor nuts. The liner is attached to the brake shoes of air brakes by studs screwed upward through the shoe into the anchor nuts. By this means the usual bolt holes through the liner have been eliminated, increasing the effective area of the liner.

A particular claim for the liner is its high heat resistance, due it is said to the nature of the ingredients, the asbestos base being bonded with a compound credited with resisting temperatures up to 700 deg. Fahr. Elimination of abrasives from the liner itself and prevention of accumulation of grit by eliminating the bolt holes is claimed to increase drum life. Moreover, the ends of the shoes are not chamfered but are ground square to act as a scraper to remove dirt and grease from the drums. Tendency to cracking is reduced by fitting the anchor nuts in the steel reinforcement.

Automotive Oddities—By Pete Keenan


PARKING IS PERMITTED ON ONE SIDE OF THE STREET ON DAYS WITH EVEN NUMBERS AND ON THE OTHER SIDE DURING ODD NUMBERS; IN PRAGUE CZECHOSLOVAKIA.
PARKING TODAY
TRANSPARENT WINGS ARE NOW BEING USED ON AIRPLANES.
THE CYNOPHERE 2 DOG POWER 1875.
WILLY VOGEL, THE RACER, HAD A STRONG MAN PUMP HIS TIRES UP IN 1906. RESULT-THE FIRST BALLOON TIRE.

The News Trailer

Write us if you know an oddity

Old Dobbin took another decision on the chin when Huron, Ont., county council, though almost completely agricultural in complexion, defeated by 19 to 9 an economy motion to supplant motor trucks with horses on county roads.

"We have given the horseless vehicle question very close attention for years, watching results of others in this country as well as foreign countries, thinking that when they had come to stay and had been brought to such perfection that we could afford to put our name on them, we would go into the manufacture of same in connection with our extensive business in the vehicle line. We feel that the time has about come for this move."—An excerpt from a letter written only 30 years ago by John M. Studebaker to a friend in New York.

There have been birthday cakes and birthday cakes, but Plymouth was responsible for probably the first cake made to celebrate a mechanical principle—"floating power."

Steps may be taken by the government to collect $400,000 from automobile owners of the Province of Quebec who are leaving their motor cars locked up in garages and barns this year, hard times preventing them from taking their machines out, or of obtaining licenses.

Due to the phrasing of the Quebec Motor Vehicle Act, automobile licenses are due on ownership of autos and not on use, so that if a man has a car, but leaves it in the garage all year, instead of using it, he is liable for the amount of his license.

A decrease of 15,620 in the number of automobiles and trucks registered in the Province was recorded up to the end of June this year.

NEWS

190,600 Vehicles Produced in June

N.A.C.C. Reports Month is Off 26% From June, 1931

NEW YORK, July 11—June production of passenger cars and trucks in the United States and Canada is estimated at 190,600 units, according to the National Automobile Chamber of Commerce.

This indicates that June production will be 1½ per cent below May and 26 per cent under June last year.

During the first half of 1932, 912,353 units were produced, as compared with 1,639,027 in the first six months a year ago. This is a decline of 44 per cent.

Heavy Ford Shipments Are Going to Sweden

MONTREAL, July 12—According to a representative of the Ford Motor Co. of Canada, Ltd., the shipment of 400 cars to Sweden in the next few days from Montreal is only a beginning. The full order amounts to upwards of 30,000 cars, he said. It is stated that the majority of these machines will be built or assembled in Canada and that if Canada had not supplied the order it would have been dealt with in England by the Ford Company there. In view of the large market supplied from Canada it is cheaper to produce in this country, it is stated.

Automotive Exports Up; Belgium Leads

WASHINGTON, July 14—May exports of all automotive products from the United States, valued at $8,445,580, were slightly higher than in the previous month, although considerably lower than in May, 1931, according to information made public today by the Automotive Division of the Bureau of Foreign and Domestic Commerce.

May shipments of automotive parts, exclusive of motor vehicles, were valued at $5,361,225, or 15.7 per cent more than the April total. The greater value of "parts for assembly" exported accounted for most of the May increase.

The report states that Belgium continued to be the leading market for both passenger cars and trucks in May. The bulk of the sales to that country are re-exported, however. The Union of South Africa advanced to second place as a purchaser of American passenger cars. The Philippine Islands were a close third.

Japan followed Belgium as a purchaser of trucks.

"Harmonic" Horns Urged for Cars

French Savant Suggests Method to Reduce Disagreeable Noises

PARIS — Automobile horns devised with the proper attention to the laws of harmonics were urged at the International Electrical Congress here as one means of reducing disagreeable noises.

The speaker was J. F. Cellerier, French savant, who told noise suppression experts what had been done on the problem in the United States, France and Germany.

He said it was not the volume of automobile horns that made them jar upon one's sensibilities but the quality.

Canadian Studebaker Is Showing Continued Gains

WALKERVILLE, ONT., July 12—At the close of June, the Studebaker Corp. of Canada, Ltd., recorded a continued increase in unit sales in 1932 over a like period in 1931.

June was the fifth consecutive month in which Studebaker sales showed increases over 1931, with six months' increase of 17 per cent. Commenting upon this business increase, D. R. Grossman, vice-president and general manager of the company, stated, "We are, of course, gratified with the better showing we have made in 1932 over 1931. However, we are confident that even further increases will be experienced in the last six months, due to the rapidly growing popularity of the Rockne."

Early Sales Data Indicate Upturn

Contra-Seasonal Trend is Seen in Polk's Preliminary Report

DETROIT, MICH., July 11—An unusual increase in sales of new passenger cars during June in seven states from which reports are now available was announced today by R. L. Polk & Co.

Registrations in Delaware, Illinois, Minnesota, North Dakota, Utah, West Virginia, and Wisconsin, indicate a 6.18 per cent increase over sales of new passenger cars in the same states during May, whereas the 5-year average shows a 17 per cent decline in sales from May to June.

Registrations of new passenger cars for June in the seven states totaled 18,094 units, an increase of 6.18 per cent over sales of 17,041 units during May, and a decrease of 22.8 per cent under sales of 23,439 units in June a year ago, in the same states.

No estimate of the total sales in June has been made because of the small number of states from which registration reports are now available.

Comparative registrations of new passenger cars in the seven states, for June, 1931; June, 1932, and May, 1932, are given in the table below:

State	June, 1931	May, 1932	June, 1932
Delaware	565	397	504
Illinois	11,241	7,720	7,619
Minnesota	3,998	3,761	3,676
North Dakota	889	611	707
Utah	720	321	400
West Virginia	2,120	1,128	1,586
Wisconsin	3,906	3,103	3,602
Totals	23,439	17,041	18,094

Peters Resigns from Packard

DETROIT, July 14—H. W. Peters, vice-president in charge of distribution of Packard, announced his resignation this week. He has been with Packard sixteen years in various capacities.

No successor has been appointed as yet.

British Columbia's Car Insurance Begins Sept. 1

VICTORIA, B. C., July 12—British Columbia's new automobile insurance legislation passed at the last session of the Legislature, will come into effect Sept. 1, it was announced follow a session of the Cabinet when an order-in-council was passed fixing the date in conformity with Ontario and other provinces in the Dominion having similar legislation.

The new legislation is known as financial responsibility insurance, and the object is to eliminate from the streets and highways irresponsible drivers of motor vehicles.

Challenge of Truck Competition Answered By N. Y. Railroads

Store-Door Delivery and Pick-Up Will Be Begun In Metropolitan Area Sept. 15, Traffic Heads of Lines Serving New York Decide

NEW YORK, July 12—Store-door delivery and pick-up of freight in the metropolitan district will be started by all railroads serving New York City and its environs on Sept. 15. Announcement of the new service was made at a conference of carriers and shippers yesterday afternoon in the auditorium of the Pennsylvania Station.

An extra charge, besides the regular freight charge, will be made for the extended service, and the rate will range from 6 cents a hundred-weight for shipments of 36,000 lb. and more to 20 cents a 100 lb. for shipments ranging from 10,000 to 13,999 lb.

The store-door delivery and pick-up service applies to carload non-perishable traffic, according to the announcement.

In announcing the plan to begin store-door delivery and pick-up of carload freight, which is regarded as the railroad's answer to the challenge of truck competition, D. T. Lawrence, vice-president of the Traffic Executives Association, made it plain that the new delivery and pick-up service would be optional with consignee and consignor. His announcement follows:

"Following their further study of the question of direct collection and delivery service at points in the New York metropolitan district, the carriers expect to make such arrangements operative on Sept. 15, 1932, as to carload non-perishable traffic from and to points in the boroughs of Manhattan, Bronx, Brooklyn and Queens and points in New Jersey in the New York metropolitan district, which may be roughly described as stations in the New York suburban area taking New York rates, under decision of the Interstate Commerce Commission in Docket 15,879 (Eastern class rate case) on traffic to and from points beyond a distance of 100 miles.

"The agencies to be employed for this service will be the subject of later announcement. The basic charges which it is expected will be published to apply in addition to the New York rates are as follows:

"Six cents per 100 lb. when the consolidated freight classification minimum is 36,000 lb. and over; 7 cents when 30,000 to 35,999; 10 cents when 24,000 to 29,999; 14 cents when 20,000 to 23,999; 16 cents when 18,000 to 19,999; 18 cents when 14,000 to 17,999, and 20 cents when 10,000 to 13,999.

"In the interest of uniformity a single tariff agency will be published for account of all New York roads.

"The matter of effecting corresponding arrangements for the collection and delivery of less carload shipments is under active investigation with a view to making such arrangements effective at the earliest possible date."

Mr. Lawrence said it was unlikely that the railroads would organize trucking departments to handle store-door delivery and pick-up shipments. The carriers contemplate contracting with trucking concerns to handle that service.

The carriers reserve the right to designate the stations in Manhattan and Brooklyn at which freight will be transferred from cars to trucks or from trucks to cars, except that pier freight, which is classified as "contract work," will be handled as heretofore, according to Mr. Lawrence.

Among the 50 representatives of carriers and shippers none raised any objection to the plan or the rates for store delivery and pick-up. A. C. Welch, traffic manager of the Brooklyn Chamber of Commerce, asked what assurance the carriers could give that the new delivery system would not eliminate existing delivery systems upon which Brooklyn is now dependent. Mr. Lawrence said he could not answer that question without further study of the situation.

F. O. Nelson, representing the Merchant & Truckmen's Association of New York, obtained leave to submit a plan by which, he said, the interests of the truckmen of New York City would be protected when the new delivery system goes into effect.

Shippers from New Jersey were interested in the probable plans by which the New York Central would deliver freight to their territory. They were informed that the New York Central most likely would handle those shipments through its connection with the West Shore Railroad.

Other organizations represented at the hearing were New York Board of Trade, Merchants' Association of New York City, Atlantic States Shippers' Advisory Board, Queensborough Chamber of Commerce, Newark Board of Trade, New Jersey Industrial Traffic League and the Port of New York Authority.

Pennsylvania Buys Dodges

DETROIT, July 12—One hundred one and one-half ton Dodge trucks were delivered this week to the Highway Department of the State of Pennsylvania.

Canadian G. M. Sales Show Upward Trend

Production Is Down But Trend Is Good

OSHAWA, ONT., July 12—An encouraging reflection on current business is the statement issued from the analysis department of General Motor Products of Canada, Ltd., in which is shown that sales of all General Motors automobiles in Canada during the first ten days of June were much higher than during either April or May. In April sales were 43.6 per cent of April, 1931; sales in May, 53.8 per cent, of May, 1931, and in the first ten days of June 66.4 per cent of the same period in 1931.

McClaren Rubber Plant is Busy

CHARLOTTE, N. C., July 13—The McClaren Rubber Co. plant here is on a 24-hr. schedule, six days a week, according to Irving Eisbrouch, general manager.

"Our business is very good at all points, and we attribute much of our present business activity to advertising," asserted Mr. Eisbrouch.

The Charlotte plant is producing approximately 45,000 automobile and truck tires each month, it was stated.

States in Reciprocal License Agreement

RALEIGH, N. C., July 12—Notification of a motor vehicle reciprocal arrangement between North Carolina and Tennessee has been given the public, highway patrolmen and all peace officers by Chairman Jeffress of the North Carolina Highway Commission.

The agreement provides for the operation of passenger cars in one state for the duration of the license obtained in the other and for the operation of trucks licensed in one state in the other state under certain conditions without obtaining another license.

The reciprocal agreement follows in part:

"All trucks duly registered and licensed in the state of Tennessee by residents of that state when operated by the owner or his duly authorized agent and engaged in hauling agricultural products produced by the owner of the truck, shall be permitted to operate in the state of North Carolina without requirement of registration and license in this state.

"All trucks duly registered and licensed in the state of Tennessee by a resident thereof when operated by the owner or his duly authorized agent and entering the state of North Carolina without load for the purpose of purchasing goods, wares, or merchandise for use or sale by the owner of the truck, shall be permitted to operate in the state of North Carolina without requirement of registration and license therein."

Mill Orders Off Despite Backlog

Shrinkage in Stocks Fails to Cheer Steel Makers, Report

NEW YORK, July 14 — Further shrinkage in the leading steel producer's backlog, leaving on July 1 a balance of only slightly over 2,000,000 tons, compared with twice that tonnage reported during the greater part of 1930 and during the first quarter of 1931, did not so much add to the steel market's dejectedness as it revived doubts regarding the statistical guidance of these monthly unfilled tonnage reports.

Bare as the steel industry's books are at this time of valid commitments beyond the current quarter, it is assumed that the leading interest's unfilled tonnage figures are made up in part of inter-company business and to a greater extent of contracts of the one-sided sort in which the seller is obligated to make shipments when ordered while the buyer cannot be forced to furnish specifications and shipping orders.

A considerable portion of the shrinkage in the last fifteen months, therefore, it is thought, was caused by the writing off of tonnage.

Based largely on gossip regarding this or that motor car manufacturer's late summer schedules, a mild recession in automotive demand is looked for over the next few weeks.

Gossip is also the basis for reports that some Detroit automotive consumers are bringing more than usual pressure to bear on third-quarter steel prices.

Competition for every pound of automotive business continues keener than keen and as a result the market for automotive alloy steels has eased off, the base price for bars having declined to 2.45c.

Pig Iron—Automotive foundries are buying only in single car lots for filling in. In the Chicago market a 50c per ton decline has brought the price of foundry and malleable to $15.50. The Valley market rules easy on the basis of $14.50 for both grades.

Aluminum—Quiet and quotably unchanged.

Copper—Early this week some producers made sales at 5¼c, delivered Connecticut Valley, but the majority named 5⅜c as asking price.

Tin—Dull, with Straits tin quoted at 20.65c on Monday.

Lead—The leading interest has brought its contract basing price to 2.70c, New York, which is in line with what other sellers are asking.

Zinc—Very quiet with sellers asking 2.60c, East St. Louis.

Duesenberg, Hurt in Skid, Is Recovering

JOHNSTOWN, PA., July 13—Fred S. Duesenberg, vice-president and chief engineer of Duesenberg, Inc., severely injured when his car went into a skid on the Mount Ligonier road, is out of danger, according to authorities at the Memorial Hospital here.

"Mr. Duesenberg is feeling much better, and I'm sure the worst is over," Mrs. Duesenberg, who came here to be with her husband, told *Automotive Industries* last night.

Suffering a fracture of several ribs and a collar-bone, Mr. Duesenberg contracted ether pneumonia. An oxygen tent was rushed to him from Pittsburgh to help in his fight to recovery.

Driving from Philadelphia to Indianapolis alone in a Duesenberg roadster, he encountered a slippery stretch while going down one of the steep mountain grades. His car rolled over, crushing and bruising him severely. No other car figured in the accident.

Firestone Hits Campaign Effect

Tire Manufacturer Expects Turn for Better in Motor Trade and All Other Industries

BOSTON, July 11—Political uncertainty, biennially in greater or lesser degree a deterrent to forward-looking business planning, and intensified in Presidential years, is now the chief deterrent to better trade conditions in this country, Harvey S. Firestone, the tire manufacturer, said here today. Mr. Firestone and his son, Leonard, were in Boston in the course of a trip combining business and pleasure.

Regarding the tire trade, Mr. Firestone said that manufacturers were producing largely for the replacement business. Although the manufacture of new cars is below the usual mark and so is not demanding as much of the facilities of the tire makers as usual, people are continuing to drive extensively and there is a large demand for replacement tires, he said.

Next year, Mr. Firestone believes, the automobile industry will have a turn for the better, along with all other industries.

"Upward Trend" Brings Huge Sale of Mohair

BOSTON, July 11 — The National Wool Marketing Corp. has sold its 1930-31 accumulation of mohair, estimated at 15,000,000 lb., to a single large regular user of the product. The corporation stated that the company bought the mohair in the belief that the economic trend had turned upward.

Automobile Financing Maintains Seasonal Upswing, 335 Firms Show

WASHINGTON, July 11—Monthly statistics on automobile financing, based on data reported to the Bureau of the Census by 335 automobile financing organizations, are presented in the table below.

These figures include complete revisions to date:

	1930 May	1931 May	1932 April*	1932 May**	Totals 5 months (January-May) 1930	1931	1932
Wholesale Financing:							
Volume in dollars	$ 83,598,097	$ 72,623,199	$33,903,704	$38,559,959	$360,170,757	$296,884,889	$174,703,186
Retail Financing:							
Total—							
Number of cars	294,057	277,950	155,691	(1)164,627	1,320,951	1,138,747	707,015
Total amount	$115,147,470	$109,372,143	$56,415,652	$58,379,589	$544,284,067	$442,173,638	$255,401,193
Average per car	$ 392	$ 393	$ 362	$ 355	$ 412	$ 388	$ 361
New cars—							
Number of cars	115,517	126,729	57,661	63,736	599,579	488,839	249,786
Total amount	$ 68,160,536	$ 68,564,134	$31,835,792	$33,521,802	$337,340,143	$263,930,997	$139,344,276
Average per car	$ 590	$ 541	$ 552	$ 526	$ 563	$ 540	$ 558
Used cars—							
Number of cars	168,164	142,796	93,398	96,065	674,822	618,749	435,707
Total amount	$ 42,823,876	$ 37,781,543	$23,066,269	$23,270,722	$188,657,532	$166,959,825	$109,032,834
Average per car	$ 255	$ 265	$ 247	$ 242	$ 280	$ 270	$ 250
Unclassified—							
Number of cars	10,376	8,425	4,632	4,826	46,550	31,159	21,522
Total amount	$ 4,163,058	$ 3,026,466	$ 1,513,591	$ 1,587,065	$ 18,286,392	$ 11,282,816	$ 7,024,083
Average per car	$ 401	$ 359	$ 327	$ 329	$ 393	$ 362	$ 326

* Revised.
** Preliminary.
(1) Of this number 38.72 per cent were new cars, 58.35 per cent used cars, and 2.93 per cent unclassified.

G. M. June Sales Reach 56,987

Report Shows 6513 Units Less Than May; June, 1931, Saw 103,303 Delivered

NEW YORK, July 12—June sales of General Motors cars to consumers in the United States totaled 56,987 as against 63,500 in May and 103,303 in June a year ago.

June sales of General Motors cars to dealers in the United States totaled 46,148 as against 60,270 in May and 100,270 in June a year ago.

June sales of General Motors cars to dealers in the United States and Canada, together with shipments overseas, totaled 52,561 as against 66,739 in May and 111,668 in June a year ago.

Below is a tabulation of General Motors monthly sales for 1929, 1930, 1931 and 1932 to date. The figures are segregated to show:

(1) Sales of General Motors cars to consumers in the United States;

(2) Sales of General Motors cars to dealers in the United States and

(3) Total sales of General Motors cars to dealers in the United States and Canada plus overseas shipments.

Sales to Consumers in United States

	1932	1931	1930	1929
Jan.	47,942	61,566	74,167	73,989
Feb.	46,855	68,976	88,742	110,148
Mar.	48,717	101,339	123,781	166,942
Apr.	81,573	135,663	142,004	173,201
May	63,500	122,717	131,817	169,034
June	56,987	103,303	97,318	154,437
July	....	85,054	80,147	147,079
Aug.	....	69,876	86,426	151,722
Sept.	....	51,740	75,805	124,723
Oct.	....	49,042	57,757	114,408
Nov.	....	34,673	41,757	68,893
Dec.	....	53,588	57,989	44,216
Total	....	937,537	1,057,710	1,498,792

Sales to Dealers in United States

	1932	1931	1930	1929
Jan.	65,382	76,681	94,458	95,441
Feb.	52,539	80,373	110,904	141,222
Mar.	48,383	98,943	118,081	176,510
Apr.	69,029	132,629	132,365	176,634
May	60,270	136,778	136,169	175,873
June	46,148	100,270	87,595	163,704
July	....	78,723	70,716	157,111
Aug.	....	62,667	76,140	147,351
Sept.	....	47,895	69,901	127,220
Oct.	....	21,305	22,924	98,559
Nov.	....	23,716	48,155	39,745
Dec.	....	68,650	68,252	36,482
Total	....	928,630	1,035,660	1,535,852

Total Sales to Dealers in U. S. and Canada Plus Overseas Shipments

	1932	1931	1930	1929
Jan.	74,710	89,349	106,509	127,580
Feb.	62,850	96,003	126,196	175,148
Mar.	59,696	119,195	135,930	220,391
Apr.	78,359	154,252	150,661	227,718
May	66,739	153,730	147,483	220,277
June	52,561	111,668	97,440	200,754
July	....	87,449	79,976	189,428
Aug.	....	70,078	85,610	168,185
Sept.	....	58,122	78,792	146,483
Oct.	....	25,975	28,253	122,104
Nov.	....	29,359	57,257	60,977
Dec.	....	79,529	80,008	40,222
Total	....	1,074,709	1,174,115	1,899.267

Rockne Shows 29% Gain

DETROIT, July 12—A 29 per cent gain in Rockne registrations for May over April—against a gain of only 8.6 per cent for the industry as a whole for the same period—was reported today by F. L. Wiethoff, sales manager of Rockne Motors Corp.

February registrations exceeded January by 45.4 per cent; March gained 96.3 per cent over February, and April jumped 104.6 per cent over March.

Dr. Jones Leaves Goodrich to Head Carnegie Tech

Dr. Webster N. Jones, general superintendent of the processing division, The B. F. Goodrich Company, Akron, Ohio, has resigned, effective August 1, to become director of engineering of Carnegie Institute of Technology at Pittsburgh.

Dr. Jones joined Goodrich in 1919 as research chemist and in 1925 he was placed in charge of the production chemical laboratories and the training of young technical men for the company.

During the war he conducted research on Lewisite and served as chemical expert on the War Trade Board. He holds a commission as Major in the Chemical Warfare Service Reserve Corps.

In engaging in educational work, Dr. Jones returns to a field in which he has spent ten years of his career, teaching at Purdue University in 1910; Harvard University, 1911; University of Maine, 1912; University of Missouri, 1913, and University of Montana, 1915-18. His interest in the careers of young men has been an outstanding characteristic and has contributed to his success in industry as well as in teaching.

Ingersoll Resigns as Federal Chief Engineer

George B. Ingersoll has resigned as chief engineer of the Federal Motor Truck Co., Detroit, and will devote his time to patent law practice in Detroit.

Associated with the Federal Co. for 15 years, he invented and developed the Federal Six Wheel vehicle, the Federal Reservoil lubricating system, and other devices.

Russell Motors Pays Preferred, Halves Common

TORONTO, ONT., July 12—Russell Motors, Ltd., declared the regular dividend on the preferred stock of 1¾ per cent for the three months ending July 31. It is payable Aug. 1 to shareholders of record July 15. The common dividend was halved.

Payment of ¼ of 1 per cent equivalent to 25 cents a share, was declared for the three months ended June 31, payable Aug. 1 to record July 15.

Directs All U. S. Rubber Advertising Efforts

DETROIT, July 12—Campbell-Ewald Co., which for the last three years has directed the advertising of United States tires, has been placed in charge of the United States Rubber Co.'s entire advertising program.

Business in Brief

Written by the Guaranty Trust Co., New York, exclusively for Automotive Industries

NEW YORK, July 12—A long stride toward the final settlement of the reparations problem was made last week when the delegates to the Lausanne conference, subject to the approval of their governments, agreed on a final settlement approximating one cent on a dollar.

It is regarded in some quarters that the ratification of the Treaty of Lausanne by the governments concerned will be considerably conditioned on some similar action by the United States in regard to our interallied debts.

REPARATIONS UNREST

Although actual acceptance of the treaty is not assured, the fact that the conference did not terminate in a breakdown, as some had anticipated, is considered an encouraging factor. The unsettled state of reparations has been a retarding factor in European recovery and has gone far in undermining international confidence.

RETAIL TRADE

Retail trade during last week was much better than had been expected, but the improvement was achieved only by special sales at reduced prices. The public has been showing a disposition to buy only when prices are lowered to very attractive levels. While there is still no great activity in general, encouragement is found in the better prices of cotton, petroleum, grain, sugar and hogs.

FREIGHT LOADINGS

Railway freight loadings during the week ended June 25 totaled 498,799 cars, which marks a decrease of 19,610 cars below those during the preceding week, a decrease of 260,564 cars below those a year ago, and a decrease of 437,891 cars below those two years ago.

CRUDE OIL PRODUCTION

Average daily crude oil production for the week ended July 2 amounted to 2,104,800 bbl., as against 2,156,100 bbl. for the week before and 2,482,500 bbl. for two weeks before.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended July 9 stood at 59.6, the same as the week before, as against 59.5 two weeks before.

BANK DEBITS DOWN

Bank debits to individual account outside of New York City during the week ended July 6 were 20 per cent below those a year ago.

STOCK MARKET DULL

The stock market last week was unsettled and dull. The tendency was downward, but the net losses for the week were small excepting in the cases of some of the market leaders. The reports of the progress made at the Lausanne conference had no appreciable stimulating influence on prices, for whatever encouragement was found in this direction was offset by domestic considerations.

FEDERAL RESERVE STATEMENT

The consolidated statement of the Federal Reserve banks for the week ended July 6 showed increases of $30,000,000 in holdings of discounted bills and of $13,000,000 in holdings of bills bought in the open market. For the first time in several weeks, there was no increase in holdings of Government securities; they remained unchanged.

The reserve ratio on July 6 was 56.3 per cent, as against 57.2 per cent a week earlier and 57.8 per cent two weeks earlier.

Parts Industry Shows Poor Half Year; Profits Are Off

NEW YORK, July 12—A bulletin of Standard Trade and Securities analyzes the present condition of the automotive parts industry. The analysis, in part, follows:

Reflecting the slack production of motor vehicles, the initial quarter of 1932 was one of the most unsatisfactory ever experienced by automobile parts manufacturers.

Earnings reports of twenty-six companies showed a total deficit in excess of $3,100,000, compared with an aggregate profit of $4,621,000 for the same companies in the corresponding period a year earlier.

The total result was substantially weighted by the heavy losses of those companies depending on Ford for the major portion of their volume; excluding these units, nevertheless, the showing was still distinctly unsatisfactory. Even the most strongly situated equipment producers found it impossible to report more than a slight level of net income and not one of the parts companies covered in this analysis was able to better the rather limited results recorded in the first quarter of 1931.

Inasmuch as automobile production expanded approximately 45 per cent, in the quarter just closed, as compared with the initial three months of the year, it would seem that the resulting demand for parts and accessories should have permitted a fairly sharp improvement in equipment company earnings. A breakdown of this increase in output, however, shows that of the first quarter total of slightly over 373,000 units. Ford accounted for only about 10 per cent.

The present estimate of production for the second three months stands at 550,000 cars and trucks, and of this number Ford built nearly 200,000. Hence, the increase in Ford's output entirely accounted for the estimated increase of 177,000 units in second quarter production figures.

Therefore, it is obvious that whatever improvement in earnings was recorded in the parts trade in the second quarter of 1932 may be attributed almost entirely to Ford. Those companies dependent on this producer for the major portion of their business will generally report the most marked betterment in earnings.

A large number of parts manufacturers, however, have found that at best, the increased Ford takings have only been sufficient to offset the decline in the requirements of their other customers, and profits of such units accordingly have shown little or no gain.

In short, while a moderate earnings improvement probably was experienced by the equipment industry as a whole in the second quarter, it unquestionably was extremely spotty in character, and in only rare instances were net profits of more than slight amount.

David R. Erwin

David R. Erwin, former assistant advertising manager of the Cadillac Motor Car Co., died suddenly Wednesday at Water Gap, Pa., of pneumonia acquired July 4 at a New Jersey resort.

Mr. Erwin was 40 years old. He was born in Georgia, but his family moved early to Washington, where he spent his boyhood. He was graduated from the Yakima (Wash.) High School and studied at Washington State College, Pullman, Wash.

Later he became a reporter on the Seattle *Times* and acted as war correspondent for the *Times* on the Mexican border after the Vera Cruz incident and later in the World War while serving with the Army. He was automobile editor of the *Times* after the World War.

For a time he was connected with the Rickenbacker organization, resigning to come to Detroit in 1923 as a member of the advertising staff of the Burroughs Adding Machine Co.

Later he entered the advertising department of Cadillac. He left Detroit in 1930 for Sao Paulo, Brazil, where he represented the General Motors Export Corp., until the revolution caused his return.

In 1931 he was sent to Japan by J. Walter Thompson, Inc., the advertising agency in the interests of General Motors Export. He came back from Japan last year and went to New York, where he became assistant general sales manager of General Motors Export.

While in Detroit Mr. Erwin was a member of the Adcraft Club.

His wife, Mrs. Margaret Erwin, of New York City, his mother, and a brother, both of Seattle, survive.

Iraq Order Keeps Trackson Co. Busy

MILWAUKEE, July 11—The Trackson Co., 1320 South First St., Milwaukee, has booked a $300,000 order from the Iraq Petroleum Co. for tractor crawlers, winches, pipe booms, tongs, etc., to be used in the field construction of a 1200-mile pipe line in the Near East. Deliveries are now under way. The plant is now on two 10-hr. shifts and employees have been recalled to make a present payroll of upwards of 150 people.

Willys-Overland June Sales Gain

56 Per Cent Increase Was Due to "Streamline" Jobs, Report

TOLEDO, July 12—The public reception accorded the new Streamline series of Willys-Overland sixes and eights and Willys-Knight, introduced by the Toledo manufacturer last month, is indicated by the sales increase of the company's product in June, the volume being 56 per cent greater than in the preceding month, H. B. Harper, vice-president in charge of sales, announced.

June showed a healthy gain over May and unfilled orders on July 1 exceeded the volume on hand the same date last year. Indications are that July business will, at least, equal and will probably exceed the sales in July of last year, Mr. Harper said.

Shop Equipment Associates to Meet in Cleveland

NEW YORK, July 12—Members of Shop Equipment Associates, an informal organization of shop equipment manufacturers distributing through automotive jobbers, will hold a two-day meeting at the Hotel Statler, Cleveland, on July 26 and 27.

It is expected that between 20 and 25 companies will be represented at the meeting which has been called for a discussion of current activities of the group as well as consideration of several problems faced by the Shop Equipment industry. Manufacturers who have not become affiliated with Shop Equipment Associates have been invited to attend the meeting.

The S.E.A. committee includes: Chairman, W. C. Allen, Black & Decker Mfg. Co.; Victor Allen, Automotive Maintenance Mchy. Co.; J. J. Burke, Brunner Mfg. Co.; C. F. Hodgson, Weaver Mfg. Co.; J. C. Markey, Aro Equipment Corp., and Ralph E. McConnell, chairman of clinic activities.

DeSoto Announces Custom Town Car

DETROIT, July 12—DeSoto has introduced a Custom Town car, the most luxurious and completely equipped model to bear the DeSoto name. It will not be a production job, but will be custom-built on order.

The smart new body type was designed to meet the needs of discriminating motorists who wish to combine the exclusive DeSoto features with a body style that affords greater privacy, together with the chauffeur-driving arrangement.

Set on the seven-passenger chassis, the new Town car has a wheelbase of 121⅜ in., making possible a gain in roominess as well as riding comfort. The powerplant is the same as that used in other 1932 DeSoto models. Duplate Safety Plate glass is used throughout.

City is Upheld In Truck Fees

Macon, Ga., Levy of 2½ to 10c per Mile, is Held Legal by Court

MACON, GA., July 12—Macon's ordinance providing for the collection from motor carriers of from 2½ cents to 10 cents per mile, based on weight, for use of the paved streets in the city, was upheld a few days ago in a ruling handed down by Circuit Court Judge L. L. Brown of Macon.

Dismissing a petition for an injunction brought by an Atlanta motor carrier, Judge Brown held, among other things, that a city is entitled to remuneration for the use of its streets.

North Carolina Sales Show Declines

RALEIGH, N. C., July 12—Sales of new automobiles and trucks in this state showed a decrease in number in June, as compared with the previous month, according to the report of Director L. S. Harris, of the motor vehicle license bureau. Sales figures as announced by Mr. Harris were:

June, 1430 automobiles and 284 trucks; May, 1459 automobiles and 291 trucks; June, 1931, 2336 automobiles and 448 trucks.

Auburn Breaks Record, Ships 3232 Cars in June

AUBURN, IND., July 12—Breaking all previous June records for shipments, the Auburn Automobile Co. built and delivered 3232 cars in June.

The former high mark for June was made by Auburn in 1931 when the company shipped 3219 cars. June shipments for 1930 were 1015 cars.

The 3232 shipment figure reflects the success of the company's new merchandising program and the great values which Auburn is giving, E. L. Cord, president, said.

Unfilled orders on hand and new orders coming in from dealers and distributors, he said, indicate that this demand is continuing consistently.

C. C. Goodrich

YORK, ME., July 10—Charles C. Goodrich, tire manufacturer and member of the Maine House of Representatives, died at his home here today. He was 60 years old.

Mr. Goodrich was a director of the B. F. Goodrich Company of Akron, Ohio, one of the largest rubber manufacturing concerns in the United States, and a brother of David M. Goodrich of Mount Kisco and this city, who is chairman of its board of directors. He was also a director of the American Metal Company of New Mexico, the Levisa Mines Company and the Moa Bay Iron Company.

He was graduated from Harvard in 1893. Among his New York clubs were the University, Racquet and Tennis, Army and Navy and Harvard. He also belonged to the Loyal Legion.

Harnischfeger Corp. Reports Large Orders

MILWAUKEE, July 11—June was the best month this year and July has equally promising prospects for the Harnischfeger Corp., Milwaukee, according to David B. Patterson, vice-president and sales manager. The company has just received an order from the California State Highway Department for three large Diesel-powered crawler-type excavating units, and miscellaneous business is reaching more substantial proportions.

Gillette Rubber Improves Plant

EAU CLAIRE, WIS., July 11—To permit of important changes in the Banbury or mixing department, the Gillette Rubber Co. here is closing July 16 for one week. Contracts have been let for raising the roof, building a platform over the mixing machines, and otherwise improving the plant layout for more efficient and economical production. Production will be resumed immediately upon completion of the work, which is expected by July 23 or 25.

Thiesenhusen Forms New Materials Firm

MILWAUKEE, July 11—Ray Thiesenhusen has resigned as treasurer and sales manager Wesley Steel Treating Co., Milwaukee, to organize the Steel Treating Materials Co., as the first Wisconsin corporation to deal exclusively in supplies used in steel treating.

Mr. Thiesenhusen during the past year was chairman, Milwaukee Chapter, American Society for Steel Treating, and is widely known in the industry throughout the Middle West.

Davis & Thompson Steps Up Production

MILWAUKEE, July 11—Orders from automotive interests at Detroit for special high production milling machines and other specially designed machine tools are keeping the Davis & Thompson Co., Milwaukee, busy at an exceptionally high rate of output, according to Frank M. Davis, president and chief engineer.

The plant is running night and day with a force of upwards of 75 skilled machinists and prospects are that this schedule will be maintained during the remainder of the year.

Ingersoll Has 2-Ply Stainless

New Steel, Developed by Borg-Warner Subsidiary, is Bonded With Carbon Grades

CHICAGO, July 12—Ingersoll Steel & Disc Co. (a division of the Borg-Warner Corp.) has developed a two-ply stainless steel to be known as Ingoclad stainless steel.

A manufacturing process is said to have been developed that gives a perfect bond between the stainless steel and the carbon steel back.

Ingoclad stainless steel is being produced at the New Castle, Indiana, plant. Its cost is said to make its use practical for many applications in the automotive field, including bumpers, lamps, radiator shells and tire covers.

This new stainless steel may be deep drawn, stamped, welded, formed and polished. It is now being produced in various gages and is already being used by several companies.

268 Violate U. S. Air Regulations

WASHINGTON, July 12—The Aeronautics Branch of the Department of Commerce dealt with 268 violations of the Air Commerce Regulations during the second quarter of 1932.

"During this quarter, the Aeronautics Branch collected civil penalties in the amount of $1,025, of which $150 applied to penalties assessed during this period, the remaining $875 applying to penalties previously assessed," Mr. Budwig said. "Civil penalties were assessed against 44 persons during the second quarter of the year. Also 31 reprimands, 106 suspensions, 23 revocations, and 15 denials of licenses were imposed for violations. In 49 cases, evidence was produced which justified dismissal of the charges.

"Violations of the provision of the Air Commerce Regulations pertaining to acrobatics led the list of specific offenses. There were 45 violations of the acrobatic clause. Other specific violations during the first quarter of 1932 were: Low flying, 33; unlicensed pilot flying licensed plane, 33; flying at night without position lights, 6; flying without identification numbers, 2."

DeSoto Does Well in Wayne

DETROIT, July 12—June was the biggest month DeSoto has enjoyed in Wayne County in three years and the third biggest month in DeSoto history in this highly competitive automobile market, according to registration figures for the month.

Report of Scheduled Transport Operations for May, 1932

Reports received from the 32 companies operating scheduled air lines in the continental United States in May show that 45,105 passengers were carried during that period, it was announced today by the Aeronautics Branch of the Department of Commerce.

The number of miles flown by the scheduled air lines during the month was 3,962,897, express carried was 97,533 pounds and passenger miles flown were 11,700,557.

Comparative statistics for January, February, March, April and May are given in the following tabulation:

	January	February	March	April	May	Total
Number of reporting companies	33	31	30	31	32	.....
Number of operating companies	33	31	30	31	32	.....
Passengers carried ...	25,960	24,774	33,532	41,127	45,105	170,498
Express (lbs.) carried..	38,580	64,996	82,953	79,275	97,533	363,337
Miles flown	3,531,194	3,231,141	3,782,691	3,723,999	3,962,897	18,231,922
Passenger miles flown..	6,075,363	5,792,166	8,139,463	10,306,475	11,700,557	42,014,024

Brazil Moderates Tariff Increases

A Brazilian decree, published in the "Diario Official" of July 2, and effective as of July 1, 1932, revises downward, with relatively few exceptions, the specific rates of import duty on automotive vehicles and related products, originally scheduled to become effective on March 1, 1932, but postponed from time to time by subsequent decrees until June 30, according to a cable, dated July 5, received by the Department of Commerce from Rio de Janeiro.

Due to the new weight basis for the assessment of duty, an exact comparison between the original and the new duties is not possible.

Kari-Keen Pioneers Direct Production

W. W. ("Wally") Wilson has been appointed factory manager of the Sioux City plant of the Gabriel Kari-Keen Co. Mr. Wilson has been long associated with the Kari-Keen business, more than 400,000 Kari-Keen carriers having been manufactured under his direction prior to the organization of the Gabriel Kari-Keen Company.

E. A. Arndt, inventor of the carrier, has been appointed engineer in charge of development work. Mr. Arndt has been largely responsible for the consistent improvement of the Kari-Keen carrier, as well as the creation of the Luggage King and the new Gabriel Carrier.

Correction

Elliott G. Reid, professor of aerodynamics, Stamford University, in a letter to *Automotive Industries*, states that the Gilmore Special race car driven by Stubby Stubblefield at Indianapolis on May 30, was not wind-tunnel tested at the University as was stated in the article covering the Indianapolis race.

"The design simply combines basic aerodynamic principles with a liberal use of what might by called designers' intuition; the drawings from which the body was built were completed within a period of ten days after beginning work on the clay model, and no wind-tunnel model was made, let alone tested.

"Important improvements in both speed and handling qualities over those of the existing car might have been made if it had been possible to spend a reasonable amount of time in testing and modifying the basic design," Mr. Reid wrote.

Delco-Remy Starts Infringement Suits

ANDERSON, IND., July 12—During the past week the Delco-Remy Corp. has brought suits in Federal courts for patent infringements and unfair competition against eight companies, manufacturing or selling replacement parts for ignition systems, starter switches and lamp dimming switches.

South Carolina Gas Taxes Off

COLUMBIA, S. C., July 14—W. G. Query, chairman of the South Carolina Tax Commission, reports that gasoline tax collections for the month of June were $530,374.69. This compares with $611,828.49 for the same month last year. Collections for the first six months of the year were $3,135,506.48, Chairman Query said. This compares with $3,451,432.96 for a like period in 1931.

Frederick J. Greene

Frederick J. Greene, prominent industrialist of Racine and a mechanical and inventive genius widely known in the automotive industries, died July 6, aged 63 years. He was founder and president of the F. J. Greene Engineering Works, the F. J. Greene Mfg. Co., the Christensen Machine Co., and of the Ideal Stitcher Co., which manufactures machines used in many of the large national magazines and publishing houses.

Joyce Lifts to Have Larger Quarters

DAYTON, OHIO, July 14—The Joyce Cridland Co., maker of Joyce Lifts and other products, has sold the plant occupied by the firm since its organization, and is planning to erect a building more suited to its needs, according to the announcement of J. M. Switzer, president.

The new home of the firm is to be erected without delay, as soon as a satisfactory site is obtained.

Reinhardt Heads Atlanta Ford Plant

F. S. Reinhardt, formerly manager of the Ford branch plants in Houston and Memphis, has been appointed manager of the Atlanta plant, succeeding J. H. Wood, Jr., who has gone to Norfolk, Va., to assume the responsibility of a larger post as manager of the Ford plant there.

Engineering Educators Elect

OREGON STATE COLLEGE, CORVALLIS, ORE., July 11—At the annual meeting of the Society for the Promotion of Engineering Education, officers were elected and awarded a national medal, in addition to listening to an address by President Karl T. Compton of Massachusetts Institute of Technology. The banquet closed the second day of the national convention that has brought nearly 200 engineering educators to this state.

R. A. Seaton, dean of engineering at Kansas State College, was elected president. Dean H. S. Rogers of this college was chosen one of the two vice-presidents with Paul Clarke of the University of Maine. F. L. Bishop of Pittsburgh University and W. O. Wiley, New York City, were reelected secretary and treasurer, respectively.

Elected to the council for the three-year period are W. N. Codleigh, Montana State; H. B. Dirks, Michigan State; F. E. Johnson, Iowa State; Moreland King, Lafayette University; C. W. Park, Cincinnati University; A. P. Poorman, Purdue University, and H. Rubey, Missouri University.

The fifth award of the Benjamin Garver Lamme medal for most outstanding achievement in engineering education was made tonight to Dr. Arthur Newell Talbot, professor emeritus of municipal and sanitary engineering at University of Illinois. Dr. Talbot, who has continued active in engineering research since his retirement from active teaching, was here to receive the award and is taking an active part in the convention.

Organization of two Pacific coast sections of the national society was decided on today when more than 85 delegates from the far West met and voted to form both a Northwest coast section and a Southwest coast section. In the former will be the states of Oregon, Washington, Montana, Idaho and Utah, and in the latter, California, Nevada, Arizona and New Mexico.

"Macon's" Frame is Now Completed

AKRON, OHIO, July 6—Framework of the U. S. S. Macon, sister ship of the navy dirigible Akron, was completed today at the Goodyear Zeppelin dock here and work was started on the covering of the giant airship.

More than 10,000 persons gathered inside the huge airdock, Monday July 4, to see the bow and last section of the framework raised into place.

The group included a number of citizens of Macon, Ga., the city that won the right to name the ship from such larger cities as Cleveland, Chicago, Detroit and St. Louis.

The Macon will be ready to fly next January, engineers in charge of construction work have estimated. Trial flights will be conducted here during the winter months under entirely different atmospheric conditions to what existed last summer when the Akron was tested and approved by the navy.

I. C. C. Lauds Use of Trucks

Recent Opinion of Body Holds Rails Should Use Vehicles

WASHINGTON, July 14—Transportation by motor vehicles, buses, and trucks over the public highways is a superior service. Rail and motor lines should be encouraged in the use of this instrumentality of commerce whenever such use will promote more efficient operation or improve the public service, the Interstate Commerce Commission said in a recent opinion.

Speed, flexibility and completeness of service are among the outstanding service advantages of truck transportation, the Interstate Commerce Commission believes.

A summary of trucking facts prepared by the American Road Builders' Association follows:

1. Trucks can haul two pounds of freight with one pound of truck, whereas railroads require four pounds of freight car to haul one pound of "less than carload" freight.
2. The truck has most effectively supplanted rail traffic in those areas that can be served one or more times during the day.
3. Overnight delivery is a fertile field for truck use.
4. Shipments are received at a later hour than by railroads ordinarily and trucks make earlier morning deliveries.
5. Pick-up, transportation and delivery is included in the truck service.
6. Unusual requirements of an industry or a shipper and emergency and irregular shipments are handled through special efforts of truck operators.
7. Flexible schedules, no wasteful packing and suitable containers are features of truck service.
8. The average load of a rail box car is about 50 per cent capacity. It costs more to haul the car than its contents. Only about ten per cent of the life of a freight car is available for live haul.
9. Commodities handled economically by truck include milk, fruit, vegetables, live stock, poultry, eggs and less than carload shipments of other goods, eliminating delays, speeding deliveries, and taking advantage of daily price fluctuations to the advantage of the shipper.
10. On hauls under 200 miles trucks require less time in transit than railroads. Crates are often returned for a small fee.
11. Smaller inventories by merchants are made possible through frequent truck shipments.

S.A.E. Production Meeting, Buffalo, Oct. 3

Plans Announced by Joseph Padgett, Vice-President

NEW YORK, July 15—Arrangements have been completed for the Annual Production Meeting of the Society of Automotive Engineers. This year there will be only one technical session on Oct. 3, fitting into the program for the National Metals Congress to be held in Buffalo, N. Y., during the week of Oct. 3.

Monday will be "production day" and will bring together the technical sessions of both the Production Activity of the SAE and the machine shop practice division of the ASME.

Joseph Padgett, Spicer Mfg. Corp., is vice-president in charge of the SAE Production Activity; Joseph Geschelin, engineering editor, *Automotive Industries*, is chairman of the papers and meetings committee.

Louisville Sales Off

LOUISVILLE, KY., July 14—New car and truck sales in Louisville for the first half of 1932 have been considerably below those of 1931, which in turn was a poor year, as compared with 1930.

In passenger car sales the total for six months of 1932 has been 2220, as compared with 3483 for the same period of last year.

June sales were 485 this year, as compared with 588 for June of last year.

In truck sales June showed an increase with 61 sales, including four trailers, as compared with 50 in June 1931.

Swiss Interested In Aeronautics

The rapidly growing interest in Switzerland in both private and commercial flying makes this country a good market for American planes, particularly of the commercial types, according to a report from Vice-Consul Carl Breuter, Zurich, Switzerland, made public by the Commerce Department.

All air transport companies are free to buy their planes from the sources offering the types which best fill the requirements of flying in Switzerland. As there is practically no commercial plane production in the country, American firms are not faced with domestic competition.

Switzerland offers a good market for light sports type planes as the domestic manufacture is negligible. The Swiss Aero Club lists 2603 non-flying members, the majority of whom are expected to learn to fly in the relatively near future. The enrollment of the club increased by 537 members last year.

Recently purchased American planes, although few in number, have proved very satisfactory and are creating goodwill which should make subsequent sales easier, the report stated.

Tennessee Gas Tax Boost Aids Revenue

NASHVILLE, July 14—Tennessee gasoline tax collections for the month of June totaled $1,059,952.85, as compared with $902,251.96 for the corresponding month of last year. It was pointed out, however, that the state tax on gasoline is now seven cents, whereas in June, 1931, it was five cents.

+ + CALENDAR OF COMING EVENTS + +

FOREIGN SHOWS

Llandrindod, Wales, Commercial July 20-22
London, Olympia Show .....Oct. 13-22
Glasgow, Scottish Motor Show..Nov. 11-19

CONVENTIONS

National Team & Motor Truck Owners Assoc., Chicago (Annual) .....July 17-19
National Team & Motor Truck Owners Assn., Detroit ....July 17-19
American Chemical Society, Denver, Colo. .....Aug. 22-26
S.A.E. Aircraft Meeting, Cleveland .....Aug. 30-Sept. 1
American Society Mechanical Engineers, Cleveland, Ohio (Machine shop practice meeting) .....Sept. 12-17
American Trade Association Executives, Atlantic City (Annual) .....Sept. 15-17
Penna. Automotive Assn., Harrisburg, Pa. .....Sept. 19-20
Natl. Assoc. of Motor Bus Operators, Chicago .....Sept. 22-23
American Electric Railway Assn., Chicago, Ill. .....Sept. 22-23
Amer. Institute Mining & Met. Engrs. (Petroleum Division), Dallas, Texas .....Sept. 30-Oct. 1
S.A.E. Production Meeting, Buffalo .....Oct. 3
Amer. Society for Steel Treating, Buffalo .....October 3
Amer. Institute Mining & Met. Engrs. (Iron & Steel Division), Buffalo, N. Y. .....Oct. 3-6
National Safety Council, Washington, D. C. .....Oct. 3-7
American Welding Society, Buffalo, N. Y. .....Oct. 3-7
American Society Mechanical Engineers, Buffalo, N. Y. (Natl. Iron and Steel Meeting).....Oct. 3-8
S. A. E. Annual Transportation Meeting, Toronto .....Oct. 4-6
American Gas Association, Atlantic City (Annual) .....Oct. 10-14
Natl. Hardware Assn. (Accessories Branch), Atlantic City, N. J. .....Oct. 17-22
Natl. Tire Dealers Assoc., Atlanta, Ga. .....Nov. 14-16
American Society Mechanical Engineers, New York City (Annual Meeting) .....Dec. 5-9
Natl. Exposition of Power & Mechanical Engineering, New York .....Dec. 5-10

RACES

Altoona .....Sept. 5

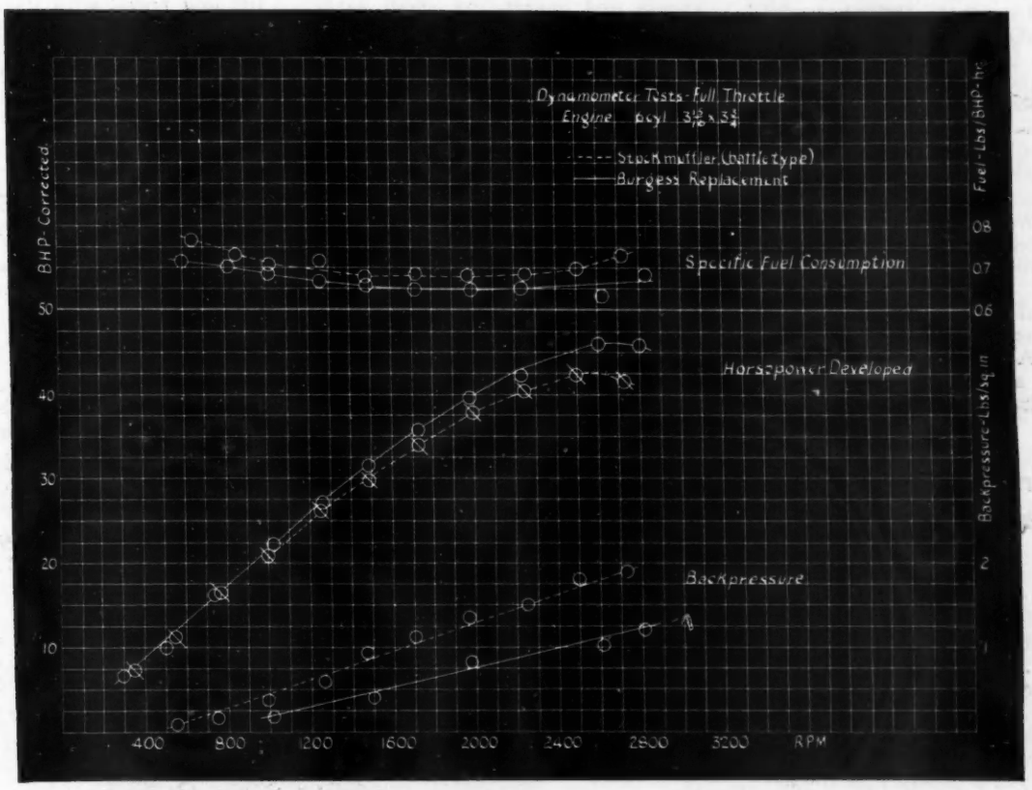
There is a Difference—

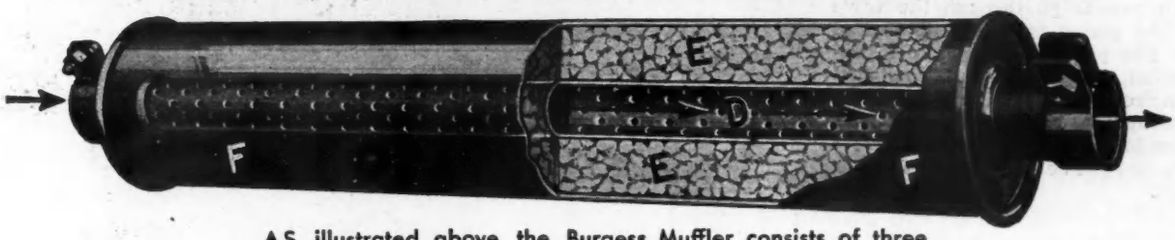
between

BAFFLE MUFFLERS AND BURGESS MUFFLERS

This chart proves conclusively the advantages of Burgess Mufflers. Study it carefully. With Burgess Mufflers the burned-out gases pass straight through the muffler as easily as through a straight tube. There are no baffles to set up restriction. Noise is silenced by the patented, acoustical construction of this muffler.

The Burgess "straight-thru" construction eliminates all waste of power in the muffler. Increases of top speed of several miles per hour have been obtained by many leading car manufacturers with the Burgess Muffler.





AS illustrated above, the Burgess Muffler consists of three principal parts: a straight open perforated pipe, D, surrounded by a sound-absorbing material, E, which is enclosed in a metal covering, F. The exhaust gases from the engine pass straight through the perforated pipe, D, but the exhaust noises are absorbed, assuring satisfactory muffling.

BURGESS
BATTERY COMPANY
ACOUSTIC DIVISION, MADISON, WISCONSIN
DETROIT ADDRESS: 542 NEW CENTER BUILDING
ENGINEERS AND MANUFACTURERS OF ELECTRIC AND ACOUSTIC PRODUCTS

NEW DEVELOPMENTS
Automotive Parts, Accessories and Production Tools

U. S. Electric Portable Drill

The United States Electrical Tool Company, Cincinnati, Ohio, has added another portable electric drill to their line. This is the ¼-in. Midget Drill which weighs 3½ lb. and is only 8 in. long (without the handle, which is removable). The U. S. Midget has been especially designed for light-duty work and where close quarter operations are necessary. It is adaptable to a wide diversity of uses.

A Universal Motor is used and the drill is furnished with a ¼-in. screw back chuck. The handle is bolted to the body but can be readily removed when it is necessary to operate in close quarters. A 10-foot rubber covered cable and a soft rubber renewable attachment plug are standard.

Dayton Improves Check Valve

The Dayton Air Compressor Co. announces the improvement of all models of compressors by the addition of an improved check valve and unloader which operates entirely on the flow of air for its action. Through its operation the pump always starts at atmospheric pressure, thus relieving the electrical equipment of great strains.

When the pump pressure is started the air cannot go through the valve until the piston is raised up out of port. The pressure getting to a certain point, the piston raises and permits a free and uninterrupted flow of air through the valve, and the piston remains in that position until the pressure is stopped before it can recede to its seat.

Greenfield "Stub" Taps With Square Shanks

In order to make its "Stub" Taps available for all automatic tapping machines, the Greenfield Tap and Die Corp., Greenfield, Mass., will supply them with a square on the end, instead of plain round shanks. This will not prevent their effective use in machines which are equipped with chucks or collets for plain round shank taps. There will be no change in price, and until further notice taps with plain round shanks will also be furnished when specified.

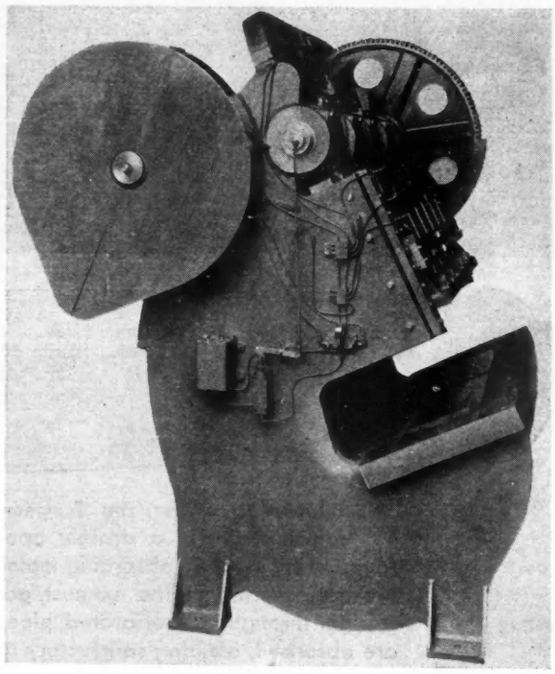
"Stub" Taps are supplied in machines screw sizes, and are said to be extremely successful in automatic tapping machines which run at high speeds and operate on small parts. The "Stub" Tap is designed primarily for tapping in thin metals, has a short thread section and taper flutes.

Loadmaster With 20 In. Electro Magnet

The Loadmaster, manufactured by Bucyrus-Erie Co., South Milwaukee, Wis., mounted on either wheels or crawlers, now is available equipped with a 20-in. Ohio magnet. This magnet equipment adapts the machine for handling scrap iron and small castings which ordinarily require considerable time for hooking. The Loadmaster requires no more space for operation than a small automobile; has a full-revolving boom and may be used as a tractor, crane, or can lift and travel with its load. Power is supplied to the magnet by a 2 kw. Kohler electric plant, mounted on the truck frame of the crane.

Henry & Wright Double Crank Press

The No. 25½ Welded Steel Overhanging Double Crank Press shown is typical of the series recently added by The Henry & Wright Mfg. Co., Hartford, Conn., to their line of welded steel presses.



This machine is inclined in a fixed position of 25 deg. from the vertical so that large blanks, such as automobile running boards and similar parts produced in compound dies, may slide by gravity to a conveyor mounted at the rear of the machine.

The frame, slide and main gear are made of welded steel construction carefully normalized and annealed after welding to eliminate any stresses set up in either the rolling or welding processes.

Particular attention is called to the design of the frame. The throat is inclined with respect to the center line of the slide and has large radii at top and bottom. Photo-elastic tests of this design of throat show that stress concentration is reduced to a minimum as compared with the throat parallel with the center of slide and small radii at the top and bottom of the throat.

Area of bed 30 x 85 in. Net weight 30,000 lb.

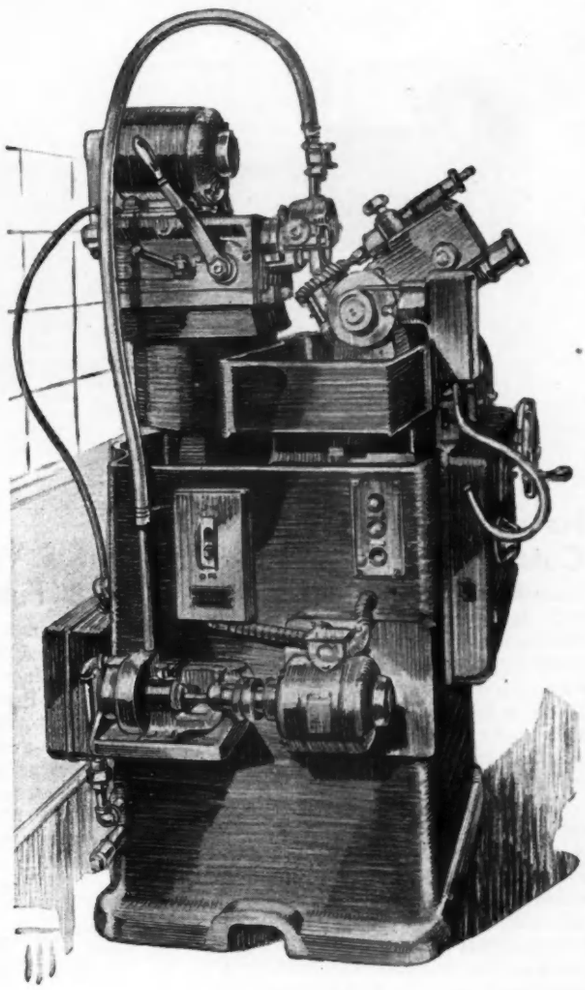
To Produce Good Helical Gears You Need . . . . .

Accurately Sharpened Helical Cutters

That is why this fully-automatic helical cutter sharpening machine has been built. It provides another measure of control over the production of accurate and smooth-operating helical gearing.

This machine not only will enable you to sharpen your Original Fellows Helical Cutters more accurately, but in addition will reduce your cutter sharpening costs. It is fully automatic with complete electrical control, and the results obtained are not dependent upon the skill of the operator.

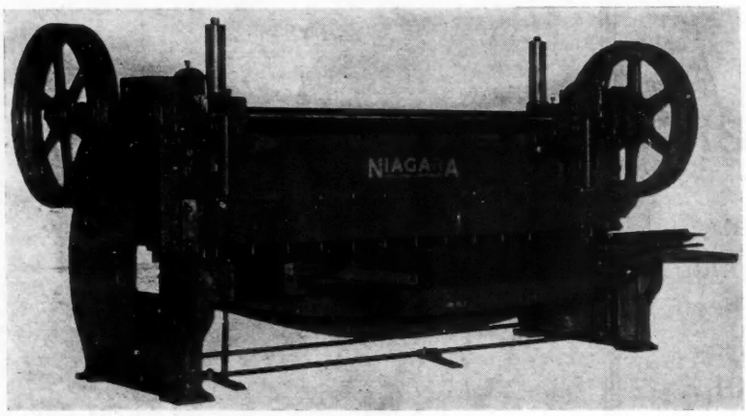
Owing to the rigidity of this machine, and control of its operation, you secure smoother cutting edges, thus increasing cutter life. Ask to have one of our representatives call and explain its many advantages. Write: The Fellows Gear Shaper Company, 78 River Street, Springfield, Vermont (616 Fisher Building, Detroit, Michigan).



This fully-automatic Helical Gear Shaper Cutter Sharpening Machine will improve the quality of your gears and cut your gear costs.

FELLOWS
GEAR SHAPERS

NEW DEVELOPMENTS
Automotive Parts, Accessories and Production Tools



CP No. 315 Rotary Drill Line

According to a recent announcement, the Chicago Pneumatic Tool Co., New York, has placed on the market the No. 315 line of rotary pneumatic drills in both reversible and non-reversible types. Four sizes take care of drills from ½ to ⅞ in.; reamers from ⅜ to ½ in. The overall length is only 14½ in., net weight 14½ lb.

The CP No. 315 is a "Power Vane" tool which employs no pistons, toggles or crankshaft. It is light in weight and well adapted to general purpose drilling and reaming, particularly in close quarters. It is sturdily constructed and powerful.

New Niagara Shear Cuts 1/4 in. x 10 ft. Plates

Smoothness, accuracy of operation, and lighter reciprocating parts are features of the new power squaring shear of structural steel and cast construction introduced by the Niagara Machine & Tool Works, Buffalo, N. Y. This shear cuts ¼ in. plates in 10-ft. lengths. It is available with 1 in. gap or 18 in. gap in housings.

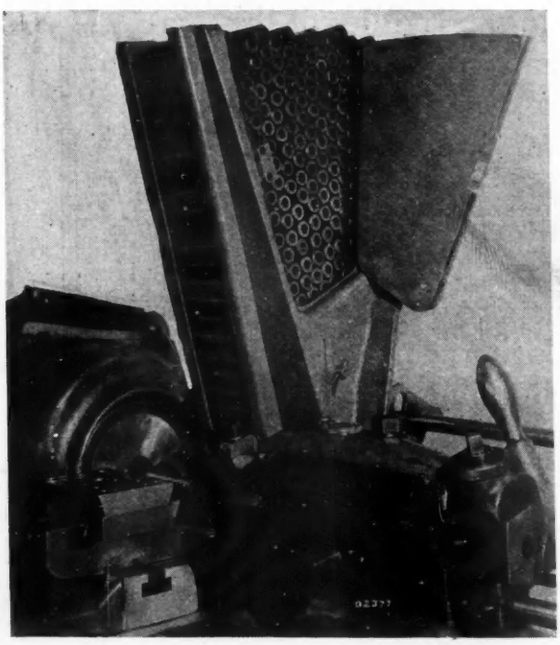
The holddown, crosshead and transverse bar are of steel. The crosshead is welded construction, consisting of a vertical member and a horizontal member tied together with triangular web sections for strength and rigidity. The heavy truss rod promotes rigidity and provides a center adjustment. The crosshead is counterbalanced with large springs enclosed in cylinders. This facilitates the functioning of the clutch and results in a more even application of power, reducing the strain on wearing parts.

The shear is equipped with the Niagara individual spring foot holddown which is said to assure even pressure in spite of variation in the thickness of the metal being cut. It is possible to cut a ¼ in. sheet and a 1/16 in. sheet simultaneously at opposite ends of the shear. Heavy and light sheets can be cut one immediately after the other without making any adjustments.

A full set of gages, front, back, bevel and side gages, are standard equipment. In addition, a slitting gage is furnished on the 18 in. gap shear. The back gage is self-measuring to 1/64 in. and can be instantly locked in the desired position. Each end is adjustable independently.

Pratt & Whitney Magazine 1 x 18" Full Automatic Lathe

Here is a new magazine developed by the Pratt & Whitney Co., Hartford, Conn., to increase the loading capacity of the Pratt & Whitney 1 in. x 18 in. full automatic lathe. The illustration shows a set-up for cast-iron automotive valve-stem guides. Three hundred pieces comprise one full load. This represents about 75 min. of work, as the valve stems are machined in 15 sec. each.

The valve stem has an overall length of 3 3/16 in. and a turned diameter of 11/16 in.; the turned length is 2½ in. The ends are faced during the turning operation, this being followed by centerless grinding, 0.006 in. of stock on diameter being left for this purpose.

With this magazine one operator can handle several more machines than with the smaller type of magazine, thus reducing the labor cost per piece from 30 to 45 per cent, it is claimed.